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ORIGINAL ARTICLES

PRESIDENT'S ADDRESS*

BY J. M. JONES, D.D.S., WICHITA, KAS.

IT is with a feeling of sadness that we open this meeting, for by the death of Dr. Johnson, we have lost a valued man and friend.

At our last meeting in Kansas City, Dr. Johnson was chairman of the program committee and you who were privileged to attend that meeting will long remember the treat he had for us. Dr. Johnson was a hard worker and a conscientious man, whom I had always admired, and it was a great shock to hear of his death. By his having lived we have been inspired to greater things.

We are thankful that we have Dr. Brady, the founder of this school, with us today. He has done more for us and more for orthodontia than any other man in this part of the United States. He is a big-hearted, broad-minded man; a man who is never too busy to give up his time, help and encouragement; a man whose name will go down in history as one of our greatest teachers, and we hope he may be spared to us and this school for many, many years.

Permit me at this time to thank you for the honor you have conferred upon me as President of this Society. I also wish to thank the program committee for the excellent program they have prepared, also our secretary for the time and thought he has given to this meeting.

To our friends, I assure you a hearty welcome and wish to extend to you all the privileges of the floor and hope you will be at home among us.

The object of these meetings is to greet our old friends and make new ones and to try to fill our bucket a little fuller of the things we should know.

We come here that others may help to solve our problems for us, and that

*Read before the Alumni Society of the International School of Orthodontia, Kansas City, Mo., April, 1923.

we may help to solve the problems of some of our fellow -members. Our problems are many; and upon our shoulders, and upon the shoulders of the International School of Orthodontia is placed a great responsibility of training men in the right methods or ground work of Orthodontia that they may go forth and make the fewest mistakes possible.

But always remembering that no man or school has ever turned out a perfect orthodontist, and that it is only by years of experience, reading, studying and meeting together as we are here today, that we can ever hope to be of any great service to humanity in our chosen specialty; we close our offices and journey forth, that we may go back better equipped to handle the problems that daily confront us.

In the memory of some of the men here present, we have passed from the horse-car to the trolley-car, from the modest second and third story building to the modern fire-proof sky scraper, but with all the advancement in transportation, modern buildings and so forth, no business or profession has advanced more rapidly than ours.

Dr. Brady told me when he first started in orthodontia that he had no particular goal, but simply moved teeth as he would a pile of rubbish, placing them in different positions from where he found them, in the hopes that they would look better in their new positions, with no particular knowledge of normal occlusion as we see it today, and with no regard to the health of the patient.

But today, we make our casts, radiograms and photos. Before placing a band, we know where each and every tooth must go to best serve its purpose, and we can visualize pretty accurately the appearance of our patient several years hence; we see the child develop along normal lines, milling its food better, breathing in the normal channels, warming and moistening the air as it is carried to the lungs and into the blood stream. We produce better appearance, better digestion, better lungs, better blood and heart action. No wonder Dr. Mayo said a few years ago that orthodontia would become the leading specialty of medicine or dentistry.

Think back a short time when the large clumsy jack-screws, heavy base metal arches and rubber plates played their part in our work. Then think of the delicate springs and appliances of today, moving teeth normally without pain and with very little discomfort to our patients. Truly we have gone a long way in the last quarter of a century, but I am wondering what the next twenty-five years will bring forth.

Naturally our appliances have made more development than any other side and today we have removable appliances that will, with a little intelligent guiding, move the most stubborn cases almost at our will, and I would hardly take the time from my office (much as I expect to learn), to come here and go to Chicago if all our programs were filled with appliances.

I think the base metal springs and arches are like the ox-cart, a thing of the past. They served their time well. A metal to which I can solder any spring, hook or spur and still retain something near its original spring is the best in modern orthodontia.

The advertising of "cure all" appliances to the dental profession is wrong.

Any dentist who is not capable of making and placing his own brand of appliances is certainly not capable of handling the simplest case of malocclusion. In most cases where I have placed appliances for dentists, the cases have been failures, and the appliances have caused more tooth destruction and abuses to the soft tissue than the benefits derived from the movement. I am not saying that the man in general practice should not do orthodontia; I think he should, particularly in smaller places; but I do say, if he has to receive his instructions from the dental supply man or sends his models to the dental laboratory or an orthodontist for that matter, he is making an admission that he knows nothing of the work and should be discouraged.

Orthodontia is not child play and we all know an orthodontist cannot be made overnight. Cases handled by untrained men and by men who will not spend the time to dig themselves out of tight places, will not reflect as a credit to our work, but will discourage other people. No man can carry a case to completion without carefully noting the changes as they occur and making the proper adjustments. I think it will be some time in the future before you can hand to some one who has no knowledge of orthodontia a mechanical something, that will work its way to a perfect occlusion. Orthodontics is mechanical, all will admit, but it is not all mechanics, and we shall have to dig deeper than mechanics to keep teeth in their positions after they are moved.

The x-ray is very valuable to us and I am sure we, as orthodontists, do not employ it as much as we should. How often have we opened and held spaces for teeth where there were no teeth? Of supernumeraries, impacted and pulpless teeth that should have been considered in our treatment, we are blissfully ignorant. There are many others, the uses of which Dr. Simpson will tell us about at this meeting.

Abnormal conditions should be treated as early as possible but I do not think a child should wear appliances from four to twelve or thirteen years of age. There should be some "breathing spells" during which the mouth may be free of all appliances. Let us do thoughtfully what is necessary for the child, at the age in which we find it; retain the teeth a sufficient time and then remove the appliances entirely, instruct them in muscle training and have them report back at stated intervals.

The oral hygiene movement has accomplished great good and is something that should not be "passed up" to the patient or on to the dentist. It is our duty to see that the teeth of our patients are kept clean, that we turn out cases with the least amount of enamel etchings possible. Of course, some teeth do decay where no appliances have been placed, but it is pretty hard to make the parent, and sometimes the dentist realize that we are not wholly responsible.

We all know that some patients have teeth that will stand a world of abuse. McCullum in his book the "Newer Knowledge of Nutrition" says, "Our present system of oral hygiene is about as effective as a rigid quarantine in an epidemic of typhoid fever from infected milk, without any effort to check the delivery of infected milk supply."

Also in the prevention of dental caries the only effective measure is to adopt a policy which will result in the formation of a dental mechanism pos-

sessing its own barriers of defense. When dietary reforms are instituted sufficiently effective to bring about results, and in addition, the dental clinic is established in our public schools on a scale adequate to meet the present day need of repair, we shall have a comprehensive dental program which will in due time accomplish the great objective: the eradication of dental caries.

According to statistics compiled by Miss Leete, of the American Child's Hygiene Association, one per cent are mentally defective, five per cent tubercular, five per cent have defective hearing, twenty-five per cent have defective eyes, fifteen to twenty-five per cent diseased adenoids and tonsils, ten to twenty per cent deformed feet, fifty to seventy-five per cent have defective teeth and fifteen to twenty-five per cent are suffering from malnutrition.

We know at the present time that scurvy, beriberi, pellagra and rickets are dietary diseases, also that decay and pyorrhea can be produced and controlled by diet.

In the National Museum at Washington are several hundred skulls of Indians who lived two and three hundred years ago and only a single tooth showed dental caries in the entire collection. Among these primitive people the diet was excellent from the standpoint of chemical completeness, and bone defects and bad teeth were practically unknown.

I am sorry that we do not have something at this meeting, upon this important subject. But we must know and teach our patients that they cannot hope to be normal and well nourished on a white bread, meat and potato diet, or rear their children in a nursery on a bottle.

A FEW DONT'S

Don't promise as much on a case as you expect to accomplish. It is always easier to explain the pitfalls you may encounter on the way, than to explain why your case is not perfect in the end.

Don't tell your patients that you know exactly what caused their particular condition. You might be mistaken, and they will probably overlook your ignorance if you correct the condition satisfactorily.

Don't tell a parent that their child is getting wonderful results, when you know the case is not progressing as it should.

Don't think more of the fee you expect to collect than the benefits your patients receive. A satisfied patient will help to pay your rent next year.

Don't be discouraged if you don't make ten thousand dollars the first year. Henry Ford was repairing bicycles a few years ago.

Don't let your office run down and look seedy and don't wear baggy trousers and soiled coat. Your patients get their first impression of you upon entering your office.

Don't, when you first start a practice, charge a fee that will drive most of your patients away. The extra work won't hurt you.

Don't allow your patients to dictate what should be done to the case, you are responsible for the results and better off without some patients.

In conclusion let us remember when we have filled our buckets with the things we should know, in our specialty, in order that we may go forth to our respective communities and deliver the best possible service, that this in itself

does not relieve us of all our responsibilities to society. We must pay and do our part to help make our city a better place in which to live and rear our family.

And for the conscientious man I know of no other fields that are greener, for we have the privilege of working for children, a clientele the equal of which men of no other specialty enjoy. And while our dollars may not multiply as fast as we think they should, our lot is a pleasant and useful one.

RETAINERS*

By Homer A. Potter, D.D.S., Kansas City, Mo.

ON taking up the subject of retention, we must necessarily deal with someing concrete, something that has already been acquired. For, just as the child studies a lesson in the evening for the next day's class, he only keeps from that study what he has worked out, and he can retain only what he has actually learned. So it is in orthodontia; only that which has been corrected can be retained, no more, and if all the abnormal conditions have not been corrected, we cannot expect to gain by way of retainers that which we have not obtained before.

In my mind, retention is the greatest single factor in orthodontia, for what good can be accomplished with a case if the teeth are not properly held and retained until permanently settled in their correct position. It takes time to correct and study out a case from the beginning until the retention stage has been reached, and at that time both the practitioner and the patient are sometimes inclined to see no further necessity of keeping anything on the teeth. But here is where your really valuable work comes in, for, quoting from Lischer:

"During tooth movement a number of very important changes are produced in the tissues of attachment. All the authorities are agreed that the immediate result of the application of force is a compression of the fibres of the pericementum on the side towards which a tooth is moved, and a stretching of those on the opposite side. In the first stages following pressure, a feeling of pain is frequently induced, due to mechanical irritation of the nerves in this membrane. This speedily ceases if the pressure is constant and is followed by hyperemia. Later an absorption of the resisting alveolar plates is produced by osteoclasts, or bone-destroying cells which make their appearance."

Owing to the fact, then, that the osseous support of the teeth is more or less destroyed by the process of absorption and the subsequent formation of new bone considerably prolonged, it leaves them suspended by their soft pericemental attachments in greatly enlarged sockets. The length of the period

*Read before the Alumni Society of the International School of Orthodontia, Kansas City, Mo., April, 1923.

of inadequate maintenance varies in different individuals, during which time the fibres of the pericementum tend to force the teeth back to their former abnormal position.

This necessitates the application of mechanism for the purpose of retaining the teeth in their new position until this tendency has subsided, and socket repair has been completed. Retention may, therefore, be defined as the maintenance of sufficient antagonism to the forces tending to cause the return of a corrected malocclusion to its original condition, to insure permanency of the normal relationship of occlusion which has been established.

No one person can say just what mechanism should be used in accomplishing this purpose. To be a successful orthodontist, one must have ability to design appliances for any and all abnormal cases. Due to this fact, nearly all forms of appliances are used, and used successfully.

It is my contention that on every retainer the labial features of the appliance should be constructed as delicately as possible. Do not place any type of retainer in the mouth that will obstruct the toothbrush from reaching the greatest surface. I do not favor the use of the interproximal ligature wire lacing, in the retentive period for any length of time, as the visits to the office during this time are too infrequent to admit of proper care of the tissues and enamel surfaces involved.

In discussing the varius types of retainers, it is only possible to give my judgment on the ones I have used, or have observed the use of from a scientific standpoint. It seems that in the East a great many of the more eminent orthodontists are using the removable plate retainers. That is, a retainer constructed of rubber, with the idea that it will remove more of the liabilities of decay by removing the fixed anchor bands; also by relieving the posterior pressure that sometimes causes spaces to appear between the premolar and the anchor molar when using the other type of retainer. They attribute this condition to the pressure of the anterior portion of the lingual bar rubbing against the anchor teeth, forcing them slightly distally and creating a premolar space.

The superior and inferior lingual plate retainers, with the notched spaces for the individual teeth to rest in, are offered as a solution for the bad effects of the fixed retainer. My objection to the plate retainer is as follows: First, it is removable; and how many patients are faithful enough at all times, regardless of what may come up, to resist the temptation of taking it out occasionally. Again, many orthodontists find trouble in making the fixed appliances and retainers not removable; for ever so slight a movement would alter the fit of the plate retainer, and destroy its usefulness at once.

Second, in the cases I have examined, I have found a great tendency to cause a shrinkage of the gingival tissues, where the plate interspaces between the teeth, causing in addition a caries condition—due perhaps to the lack of thorough cleansing of the plate.

Another feature that is often complained of is the bulkiness and inconvenience of this retainer. Third, I feel that they do not permit of any fine adjustment being made while the retaining is being done, as we often do in

our fixed retainers on Class I and II cases, particularly. There also arises the old phase, dealing with the matter of taste, with the plate hindrance.

It is with the above ideas in mind that I have tried from my limited experience to formulate my own judgment on what retainer approaches the ideal. The ideal has not arrived as yet, but to my mind, the best type of retainer that can be used for all cases is a combination of the molar bands, with its buccal tubes, and the fixed lingual bar extending from first molar to first molar, and curving into the interproximal spaces as it goes around; then reaching distally from the first molar band to engage the second molar.

In order to effect the posterior pressure on the anchor teeth, I bring in the curved lingual bar, resting snug in the interproximal spaces. In addition to this curve, I also fit little curved lugs to rest against the lingual bar, and against the mesial lingual surface of the premolars, and these are soldered to the lingual bar. This gives a six tooth anchorage for the retainer, and in most cases this lingual retainer is all that is needed. The lugs are so placed that they will hold a rotated premolar in perfect position without the use of a band.

It has been my experience that in the majority of Class I cases, and also in a good per cent of Class III cases, one only needs mandibular retainers—that the holding of the teeth of the mandible in correct position will bring the corrected uppers in an even better working occlusion than would be possible with two rigid retainers in use at the same time. On eleven cases followed through a period averaging two years and three months, I have only had to place small bands with finger springs on the maxillary centrals.

The value of retention is increasingly apparent, and it is my belief that it is one of our greatest assets, not from a financial view, but from a moral one. Just as soon as a case is brought to the point where the labial appliances can be removed, and a carefully contoured interstitial retainer with its component parts substituted, it is our duty to place it on. This removes at least 75 per cent of the additional chances of decay from appliances holding food debris; the patient is pleased by the added appearance of a rounded arch, with not much showing on the labial surfaces, and the orthodontist has the advantage of the lessened work from that which is necessary in a completely applianced case. I only charge a half fee for my retentive period, and that for only one year—thereby eliminating the most natural cause of the patient's desire to have them removed—and have found this plan most satisfactory in my own practice.

It has been my observation that about 25 per cent of orthodontic cases can be finished and retained sooner than we have been in the habit of doing, especially in the Class I and III divisions of malocclusion. In the advanced cases of Class II malocclusion, where my records show them to be of a hereditary nature, I have proved to my partial satisfaction that they can be corrected and retained nicely for two years—and then after the removal of the retainers the bite will drop back gradually to, or almost to, its former position. It is my belief that our treatment and retention here should be built up around the extraction of the maxillary first bicuspids, getting our cor-

rection, not by an attempted bone growth in the mandible, but by the retraction of the anterior teeth in the maxillary arch alone. Dr. Calvin D. Case holds the above views, and has contended that such has been his experience for years.

Now in reference to Class II cases of malocclusion, I am going to divide them into four classes, as they respond to treatment:

Division A will take in the normal child as to health and physique, up to the age of 14 years.

Division B will include children up to 14 years of age who are underdeveloped, anemic, or of a tubercular tendency—in other words the subnormal child.

Division C will include all between the ages of 14 and 24 years, who are normal in health.

Division D will include the ages from 14 to 25 years, who present the same subnormal conditions as are manifested in Division B.

In treating Division A cases, you can expect to succeed in the great majority of cases, if carefully treated, and this class will permit good retention and remain fixed, with real bone tissue development in the stimulated areas.

In Division B, only partial results can be obtained; and, as Dr. Case has stated in his writings, this class returns more frequently to its original position. In a case of this type you are nearly always confronted with a small narrow face, with poor circulation, and with its lack of red blood cells.

In Division C, pretty good results can be obtained by the extraction of the first premolars in the maxillary arch, and the moving of the anterior teeth distally. In this instance, the mesial movement of the posterior teeth can usually be prevented by a double molar anchorage, and a continuous buccal tube. The retention here is simple, being mainly the holding back of the maxillary anterior teeth.

With Division D you can hope for very little unless you can get it by extraction. The tissue response is practically nil, and I believe this class nearly 100 per cent hopeless unless the general health can be built up to normal, or approaching so.

I am more and more convinced that we are sometimes inclined to quit our cases too soon because we fail to take into consideration the age of the individual, the condition of the blood, lung action, and all other symptoms that might lower the vitality of the patient. A good many cases are deprived of the lasting good to be gained from a finished case by too much "fingeritis." I believe that if we will take the parents into a close and definite prognosis of the case, especially during the stage of retention, that we will be able to finish twice the number of cases that we could complete, otherwise.

A retainer should be constructed in as simple a manner as possible, just enough antagonism present to prevent any return of the teeth to their former position. And they should be so constructed that they will interfere as little as possible with mouth hygiene, for too many children are inclined to neglect the tooth-brush, and if any abnormally large appliance hinders them it will aggravate this tendency toward neglect.

By using the precious metals it is possible to use a small guage appliance,

and yet have sufficient strength. In planning the retention appliances for your case, bear in mind that the class of malocclusion must be considered, for where any great amount of bone development has been obtained by use of rubber interlastics you must construct your retainers in a manner that will permit of the use of light rubbers, if needed.

I am convinced that the use of carborundum powder in grinding down the few high spots that are hindering a better occlusion will greatly aid the success of the retention period. This is accomplished by the patients themselves moving their teeth in a grinding manner from right to left in a full arc swing, with the teeth, over which has been smeared the powder paste, in contact.

Retention is a series of attempts to preserve that which we have gained by hard study and persevering work, and only by close application of all the forces involved can we hope to succeed.

SIMPLIFIED ARCH LOCK

By H. K. von der Heydt, Butte, Montana

AS far as I know the following arch lock is original and I am taking the liberty of presenting it for the benefit of those who may desire to use it. The main point in favor of it is that it is very simple in construction, inexpensive and can be made in a very few minutes.

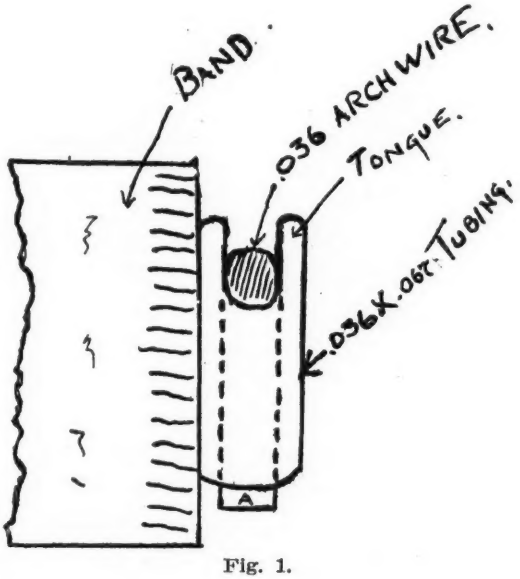


Fig. 1.

This lock can be made any size desired; for the .036 lingual arch procure about six inches of tubing .036 × .067 and with a Joe-dandy disk cut a slot in the end of tubing about one and a half times as deep as the .036 wire is thick, rounding same off on the bottom so that the wire will lay flat; try

wire in slot before cutting lock off of main piece of tubing as it is easier to handle in the long piece and see that the slot is wide enough to let wire down comfortably; then round off top of the two ends slightly with a file to remove all roughness and sharp edges; then force wire into tubing (wire being straight as yet) to remove feather edge around hole. Then cut tube off of main piece about 1/16 of an inch below bottom of slot with disk and file flat on the bottom. Force wire into tubing again to make sure that it goes in before soldering tube onto band and then solder same to band in the proper location. On the maxillary molars place tubes on bands with slot down and on mandibular with slot up. Place bands in position in the mouth, take impressions and run models. File the end of the wire flat, rounding the edges slightly and force same into tubes, allowing it to project about 1/32 of an inch and mark spot approximately at the bottom of slot; remove wire and bend

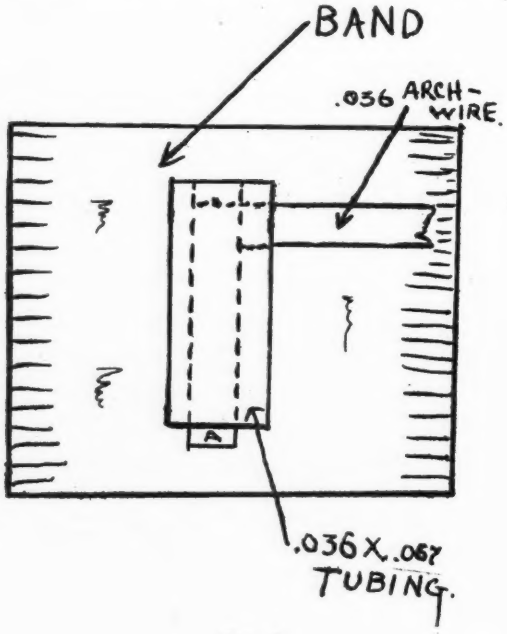


Fig. 2.

sharply at right angles after annealing. Place into tubes and force into place. The wire must go well down into the slot and seat, at the bottom, leaving the tongue on the tube to extend above the wire. Mark the wire on the other side, remove, bend, trim off, and replace. Heat the wire to cherry red and adapt to model; remove, polish and place into mouth. (An automatic mallet with a foot plugger is invaluable in seating wire.) After wire is properly seated bend tongue over same with flat serated instrument. I use an amalgam plugger for this purpose and case is completed.

In making locks for labial appliances for .020 or .022 wire use tubing .020 or .022 × .042; make slots with a common jeweler's saw, using the regular fine saw blades, testing them by sawing into a piece of plate metal (brass preferably) and trying wire into cut; if saw is too large, making a slot too wide, the blade can be made narrower by rubbing the sides of blade (while in frame) with a carborundum stone until desired size is obtained. Then

saw a slot into end of tubing by sawing with the saw blade in the frame backwards, that is, have the teeth pointing forward and drawing saw backward. In this way a slot can be cut very easily without bending tubing or having the saw "grabbing." Cut off the tube by filing with edge of half round file, trim flat, try wire and proceed as in larger wire. To remove arch wire press on projection "A." I am using this "Lock" on some thirty odd cases and find it to work to my entire satisfaction.

APPLICATION OF SPRING FORCE FROM GOLD AND PLATINUM REMOVABLE APPLIANCES.*

By Martin Dewey, D.D.S., M.D., New York City.

REMOVABLE appliances have been used for the correction of malocclusion of the teeth for many years, and naturally the orthodontic specialist is familiar with Dr. Jackson's method and types of apparatus. The removable appliance has always possessed a good principle, because of the application of spring forces and it is this mechanical feature that has caused some men to particularly favor this style of fixture for the correction of certain types of malocclusion.

Fig. 1

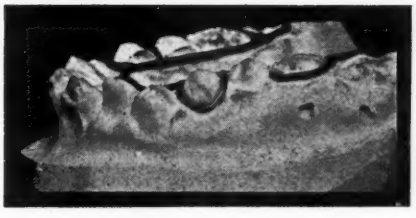


Fig. 2.

With the advent of gold and platinum in the orthodontic world we have obtained a material which is decidedly different from that which was formerly used by men who were specialists in the construction of removable appliances. The use of gold and platinum appliances which employ spring force is known to nearly all of us because of the work and technic of Dr. Mershon. His lingual wire, as first described, might be termed "fixed removable appliance" because it was so constructed with a mechanical locking device as to make it quite rigid and embody certain features which have always been associated with and described under the term "fixed appliance."

*Read before the American Society of Orthodontists, Chicago, Ill., April 24, 25, 26, 1922.

Removable appliances made from gold and platinum so as to develop a certain technic were first shown to me by Dr. George B. Crozat and presented in a paper at St. Louis, in 1918. Prior to that time Dr. Walker of New Orleans had experimented with gold and platinum in the construction of removable appliances similar to Dr. Jackson's type and possibly Dr. Crozat obtained some of his ideas from association with Dr. Walker. Lately, gold and platinum, in construction of removable appliances has been employed by several men. I know that Dr. Halley of Kansas City has also been constructing removable appliances from gold and platinum for a time.

THE AUTHOR'S VIEWS ON GOLD AND PLATINUM.

My experience with removable gold and platinum appliances is a result of association with Dr. Crozat and seeing his technic as demonstrated to

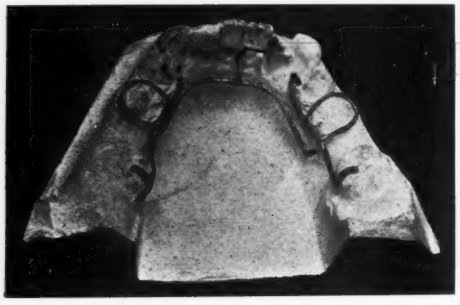


Fig. 3.

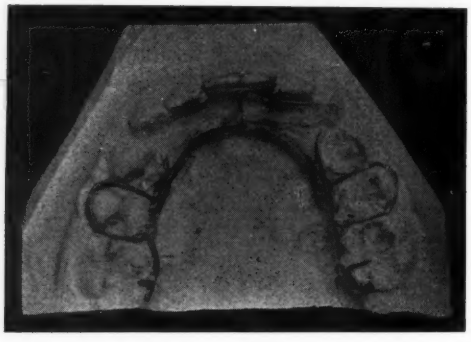


Fig. 4

Fig. 5.

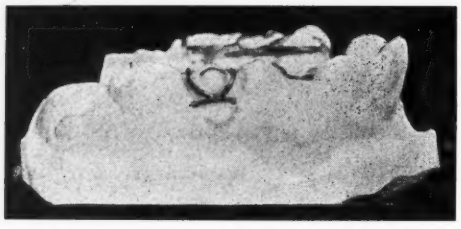


Fig. 6.

the students, and also from the analysis of certain principles of Dr. Jackson's removable appliances. It seems to me that spring force is ideal in certain types of malocclusion. Gold and platinum is a desirable material from which to obtain that spring force, as was proved by use of that material in the construction of lingual appliances with finger-springs, similar to the designs of Dr. Mershon and the modifications of this design as used by others. Consequently it seems perfectly logical to combine these various ideas together and to utilize the spring force as possessed by elastic gold and platinum for the construction of removable appliances.

I will not take the time to show you finished cases, which have been treated by the removable appliances, because that would simply lengthen the paper, and my intention today is to give you principles in the construction of these appliances and reasons why the appliance has been designed along particular lines. With this in view the first illustration, Fig. 1, presents a type of a removable appliance constructed from spring gold which was used on the case shown in the illustration. The appliance was used in this instance, because, to a certain extent, of convenience. You will notice that the molars are badly atrophied and very short as are also the incisors. The principal problem was the atrophied and unerupted condition of the molars with a certain amount of gingivitis which made the use of a band rather questionable.

The clasps used are not exactly typical of those used by Dr. Crozat, although similar to a certain extent, to those employed by Dr. Jackson. The idea of the approximal embrasure grip-clasp as used on the molar, was obtained from Dr. Roach of Chicago after seeing some of the clasps which he uses for the retention of his removable bridges and partial dentures. The approximal embrasure clasps were satisfactory in every respect and the arch was widened in the anterior region by the adjusting of the loop in the body wire, and after expansion was obtained, finger-springs were added to the body wire just as they would be added to any lingual wire in order to correct the malocclusion of the incisors.

Fig. 2 shows a buccal view of the clasps as construction around the premolar and also approximal embrasure clasp on the molar.

Fig. 3 is an illustration of an appliance used on a patient in the College clinic. It will be noticed that the construction of this appliance differs considerably from that of Figs. 1 and 2, and to a certain extent, approaches some of the features as outlined by Dr. Crozat. This appliance analyzed to a certain extent, according to the plan suggested by Dr. Jackson, includes a lingual base wire, which is preferably made from 16 gauge gold and platinum, Aderer's No. 4 wire. The molar and premolar section of the appliance can be constructed from 18 gauge wire, but must be so made as to have an occlusal rest in the central fossa of the first premolar and the occlusal rest in the occlusal lingual groove of the molar. This lingual base wire is placed sufficiently gingivally, so as to be gingival to the lingual convexity when the occlusal rest is in place as described. The wire when pressed into position by the elasticity of the lingual base wire remains in a definite position on the tooth and has no tendency to slip occlusally or gingivally. Clasps were placed on the premolars constructed after the design suggested by Dr. Crozat, the detail of which will be shown later.

It will be observed in Fig. 4, same as Fig. 3, that pressure is brought to bear on the incisors, by the construction of what we call the "T bar," which consists of an elastic wire about 20 or 21 gauge, shaped to fit the lingual surface of the incisor and attached to the median portion of the lingual base wire by an iridio-platinum extension, forming the upright por-

tion of the T bar. This particular style of spring was brought to my attention by Dr. Porter, but may have been used by others previously.

Fig. 5 is another appliance constructed for the maxillary arch, practically the same as Figs. 3 and 4 and shows more clearly the occlusal rest on the first premolar and molar. It will also be noted that the lingual wire on the lingual surface of the molars and premolars has been extended sufficiently forward to engage the mesial surface of the first premolar, and sufficiently posteriorly to grasp behind the lingual convexity of the first molar. This lingual premolar and molar section of the appliance, when held in position, is so shaped as to maintain the approximal contact of the molar and premolar section and prevent any of the teeth from drifting anteriorly or posteriorly from each other. In other words it affords a group anchorage,

Fig. 7.

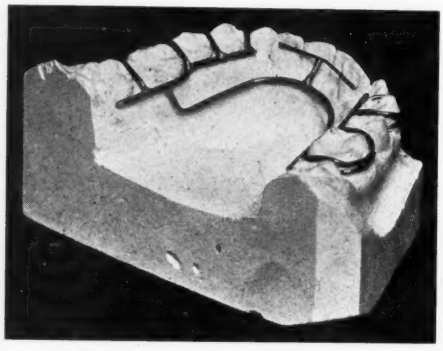


Fig. 8.

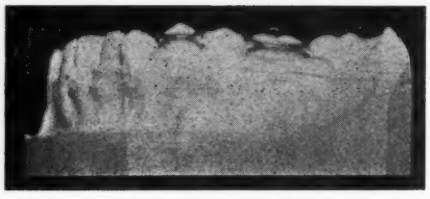


Fig. 9.

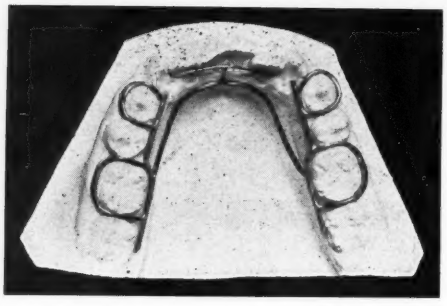


Fig. 10.

which has been so ably described by Dr. Jackson, in his writings, and which is decidedly advantageous in all cases where you have a normal approximal contact to begin with.

Fig. 6 is made to show the buccal appearance of the clasping device on the premolar which is designed after the suggestions of Dr. Crozat. By examining Figs. 3, 4 and 5, you will see that the premolar clasp consists of a piece of wire of 21 gauge which is made to fit the occlusal surface of the premolar and is so bent as to extend gingivally on the buccal surface, a certain distance. You then take a piece of this wire and make it crescent shape; the free ends or what has been termed the "claws" are made to fit gingivally to the mesio-buccal and disto-buccal convexity of the premolar and clasp in the approximal embrasures. They are attached with a

little solder close to the buccal portion of the premolar clasp. This crescent piece of wire acts on the same principle as Dr. Roach's approximal grip clasps, used on his removable bridges or partial dentures. It is very easily adjusted, because both ends are free and either end can be adjusted without disturbing the other or changing any part of the appliance or clasp.

Fig. 7 shows a rather typical, or what I might term "classical construction" of a removable appliance made from spring gold wire adjusted to a typical case of neutroclusion. It will be seen by Fig. 7 that this patient had erupted the premolars and the second molars which were also included in the premolar and molar section of the device. The clasps, of the Crozat type, were applied to the premolars and molars, which gave a very secure anchorage. As a rule I do not expand the molar and premolar section of the appliance any father forward than the mesial surface of the first premolar and if it is desired to exert pressure on the canines, a small gauge wire is soldered on to the lingual portion of the appliance. The handling of the canine with this type of appliance depends entirely on the position of

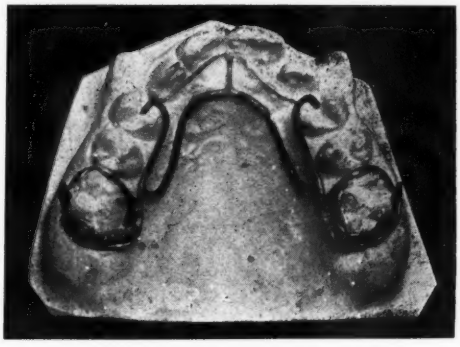


Fig. 11.

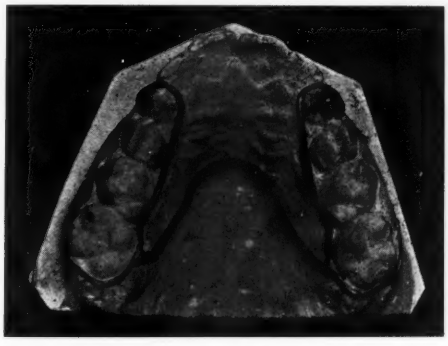


Fig. 12.

the canine. If it is desired to move the canine outward, and to rotate the distal corner of the tooth buccally, as shown in Fig. 7, then the extension is soldered on the premolar portion of the appliance, the action of which will be shown in another case. This figure shows the possibility of compound reciprocal anchorage between the right and left sides and for equal expansion of both sides, and I think it has qualities that are not surpassed by any other style.

Fig. 8 is another view of the same case and appliance, and shows the position of the buccal clasps on the molars and premolars. It shows the position of lingual wire on the opposite side as it rests against the molars and premolars, and the position of the T bar against the incisors.

In Fig. 9, we have a buccal view of the same case which shows the position of the clasps as they grip in the approximal embrasures of the teeth.

Fig. 10 shows a case in which a finger-spring extension has been soldered to the premolar section to rotate the canine. This shows the case at the time this appliance was removed and a soldered lingual arch substituted for retention because the patient could not be seen at frequent intervals. It

demonstrates the application of a finger-spring for the purpose of including the canine and correcting torsiversion of the same.

Fig. 11 shows an appliance, the construction of which is similar to the others, but the anchorage on the molars is of a type such as suggested by Dr. Jackson. As you will see, it consists of making bands on the molars with a buccal lug, and the locking device consists of a spring wire extending distally to the molar and around on the buccal side, occupying a position gingivally to the buccal lug.

With this style of locking device it is essential to have the occlusal rest on the molar portion to prevent the lingual appliance from slipping gingivally and interfering with the soft tissue. It will be noticed that in the premolar region the end of the wire is bent to engage the mesial surface of the premolar and that it lies gingivally to the lingual convexity of the premolar so that the wire will be prevented from slipping occlusally. The occlusal rest in the occlusal portion of the central fossa of the premolar prevents the wire from slipping gingivally. If you desire to have a greater anchorage in the premolar region and your appliance more secure, you will have to extend the approximal grip clasp around the mesiobuccal surface of the premolar ending in the distal approximal embrasure of the first premolar. This is similar to the clasp that was used on the appliance shown in Figs. 1 and 2.

I have used the approximal grip clasp on cases similar to Fig. 11, which greatly increases the stability of the device, but which is not necessary, provided you have the anterior portion of your lingual wire in the premolar section bent to such shape as to engage the lingual approximal contact of the premolar both gingivally and occlusally to the lingual convexity of the same.

Fig. 12 shows a similar appliance which was placed on the maxillary teeth to produce expansion in the canine and premolar region. Bands were placed on the molars the same as were shown in Fig. 11. This case you will see, is one in which we have protrusion of the premaxillary incisors but we desired to produce expansion at the same time the lower appliance was being used to open up the spaces for impacted premolars. After the expansion of this case by the lingual appliance, the future treatment will depend on the lip action. If lip action is normal, no other appliance will be necessary. If lip action is abnormal it will be necessary to use a high labial arch with finger-springs. This can be easily used by soldering tubes to the molar bands that are already in position on the first maxillary molars. The lingual appliance can still be used as a means of retaining expansion or can be replaced by the soldered lingual wire. The important thing is, that this style of appliance provides expansion in the canine and premolar region as satisfactorily and more easily than can be obtained with any other style of appliance. So far, the cases which I have shown you have been of a type requiring a reciprocal anchorage, with the same movement of the teeth on both the right and left sides.

Fig. 13 shows a case in which we have the premolar on the right side

lingual to the mandibular teeth. The molars and premolars were in very good alignment and occupied their proper bucco-lingual relation to one another. We believed that a spring force would be ideal for moving the molars and premolars on the right side buccally. In order to obtain greater resistance on the left side, we have enlisted five teeth (canine, premolars and molars) and have placed a clasp on the first premolar, of the Crozat type, which if properly constructed, holds a tooth very rigid and interferes greatly with the tipping movement. On the right side it is necessary to move only the premolars and first molar. The lingual wire was so extended as to include only those three teeth with a clasp on the molar band and the occlusal rest on the first premolar as described in Fig. 11. We purposely avoided making a Crozat clasp on the first premolar on the right

Fig. 13.

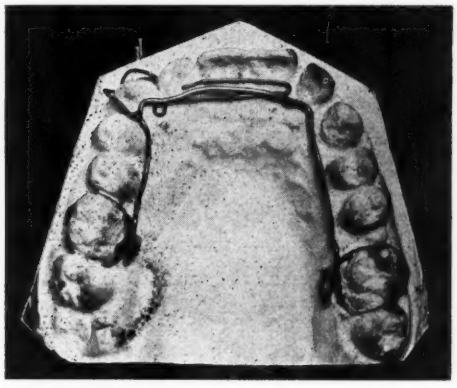


Fig. 15.

Fig. 14.

side, because it would interfere with the tipping of the first premolar and we believed the most desirable result could be obtained in a short time by tipping that tooth and depending upon the occlusion to straighten it up after it was in the desired position, or else to use mechanical means to move the root if necessary.

A finger-spring was employed to exert force on the lateral incisor to gradually carry it forward to its desired position. A different style of appliance, or rather modifications of this appliance, will be necessary before the incisors can be finally lined up and the case finished, and we are also convinced that for the particular movement desired, this appliance fulfills all requirements.

Fig. 14 shows the left side of Fig. 13 in which will be seen the con-

struction of the molar anchorage as obtained by the molar band and lug and the premolar anchorage with the clasp as designed by Dr. Crozat

I have already stated that one advantage of this appliance, or in fact of any similar appliance with the crib anchorage, is that you maintain the premolar contact of the teeth and carry the molars and premolars to position with less disturbance than when you have your anchorage on individual molars.

In using the single tooth for anchorage, which is often employed with the lingual appliances of the fixed type, I only need to show Fig. 15, which is from actual practice, to impress upon you the danger of this type of anchorage. The finger-spring exerting pressure on the incisors has resulted in a posterior displacement of the first and second molars on the left side. You may wonder why the right molars were not equally displaced, but the finger-spring extended along the right canine for the purpose of depressing it, prevents a posterior displacement of the right molar. Therefore, the advantage of group anchorage as obtained in the style of appliances I have shown you, is something that must be taken into consideration.

We believe that for the treatment of certain cases, removable appliances, constructed from gold and platinum, utilize the spring force more satisfactorily than can be obtained with any other appliance. I have not used this appliance in posterior occlusions and anterior occlusions as employed by some men, but the principles of anchorage and construction are safe and sound and are factors which I believe possess great possibilities.

DISCUSSION

Dr. George B. Crozat.—In the preparation of my discussion of Doctor Dewey's paper on the "Application of Spring Force from Gold and Platinum Removable Appliances," I thought it might be advisable to devote a few moments to reviewing the incidents which led to the development of my technic in the construction and use of these appliances.

I was remarkably impressed with the advantages of removable appliances in the regulation of certain types of malocclusion when Doctor Eby demonstrated the construction of Jackson appliances at the Dewey School when I attended. The mechanical advantages and principles which Doctor Jackson has previously brought before the Society, needs no repetition. Further, the possibility of thorough cleansing of the teeth and appliances recommended their use.

In the beginning of my practice, I employed Jackson appliances in a number of cases, and it became my good fortune also early in my practice to have under observation two cases that had been treated by Doctor Walker and which came in to me for observation after his death. These patients wore previous metal removable appliances which accomplished the results desired.

Shortly after this Ney's Elastic Gold was called to my attention and I determined to try to copy Doctor Walker's appliances, bearing in mind all the principles I had so far learned of the Jackson appliances.

From that beginning, I have developed the technic which I will endeavor to show you in my clinic.

It was with pleasure that I read Doctor Dewey's paper which he forewarded me in which he illustrated many types and modifications of precious metal removable appliances.

It is not necessary for me to discuss the illustrations of this paper as you are familiar with the principles of the fixed lingual arch and Jackson appliances which this embodies.

It is preferable to state the alloys I employ.

For the attachment or cribbing device, I use Ney's Oro Elastic Gold Wire, 21 gauge.

Body or Base Wire, depending upon the size, is usually constructed of 15 or 16 gauge S. S. White's Clasp Gold wire, with arms of 18 gauge.

All extensions from these parts are usually either 20, 21, or 22 gauge S. S. White's Clasp Gold Wire.

The attachments in group anchorage as illustrated by Doctor Dewey add stability to the appliance.

I will now show slides of cases which illustrated my paper of the St. Louis meeting of the Alumni Society, and in which these appliances were used in their treatment.

Fig. 1 is an occlusal view of the appliance used in the treatment of Fig. 12, in which the high labial wire carried an incisor.

Fig. 2 shows the same appliance from the labial aspect.

Fig. 3 an example showing construction of a lower appliance.

Fig. 4 illustrates a case of bilaterally posterior relation of the mandibular arch with protruding maxillary anterior teeth before and after treatment.

Fig. 5 shows a case of unilaterally posterior relation with retruding and bunched anterior teeth.

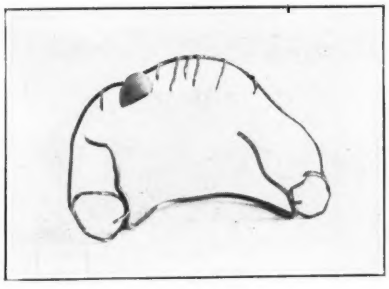


Fig. 1.

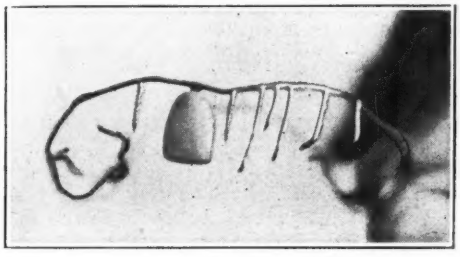


Fig. 2.

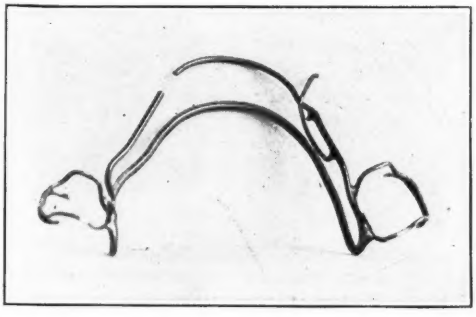


Fig. 3.

Fig. 6 illustrates a similar case with the exception that the maxillary molars on the left side are in lingual version to the mandibular teeth.

Fig. 7 illustrates a case of bilaterally posterior relation of the mandibular arch in which the protruding anterior maxillary teeth had been depressed without establishing a normal antero-posterior relation of the arches.

Fig. 8 shows a case of neutroclusion with labioversion of the maxillary incisors.

Fig. 9, the same case, occlusal view, showing expansion accomplished.

Fig. 10 illustrates neutroclusion with bunched anterior teeth or a complex neutroclusion.

Fig. 11 shows laterial views of the same case as in Fig. 10.

Fig. 12 shows a case necessitating regulation for bridgework with excessive space for the restoration of an incisor.

Fig. 13 shows a case of bilateral posterior occlusion before and after treatment.

Dr. J.A. Gorman, New Orleans.—I have had the pleasure of using this apparatus for a number of years. After Dr. Wm. E. Walker's death the court turned his office and practice over to me, and I saw numbers of his cases in which the apparatus was used. In fact,

about 90 per cent of the cases remained with me so I saw the results Dr. Walker had obtained by this apparatus. It is a beautiful apparatus and wonderfully made. I constructed numbers of them and carried out Dr. Walker's principles, and I believe in giving credit

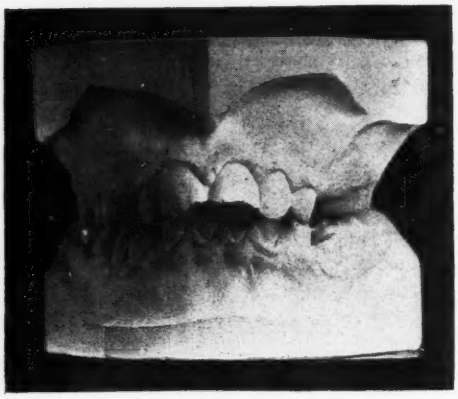


Fig. 4.

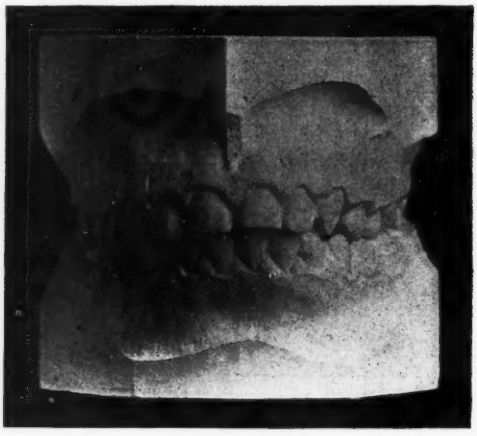


Fig. 4.

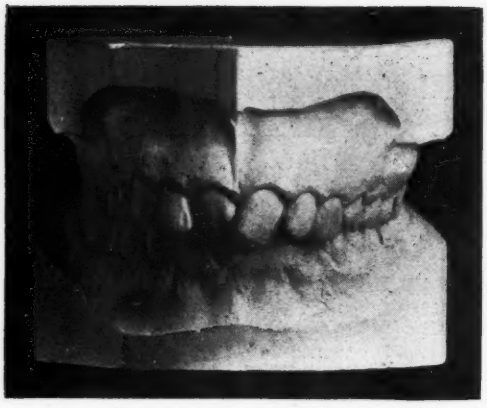
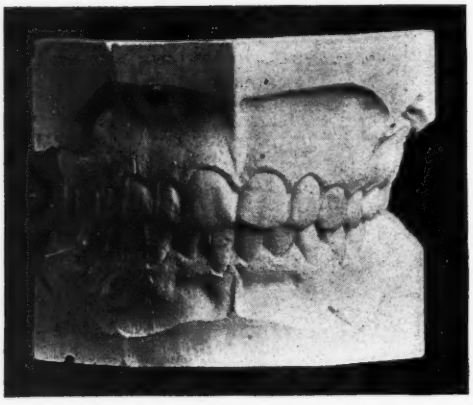


Fig. 5.



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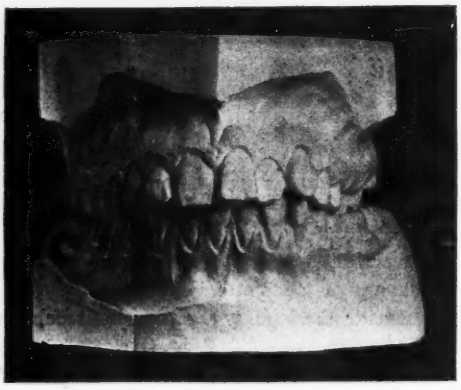


Fig. 6.

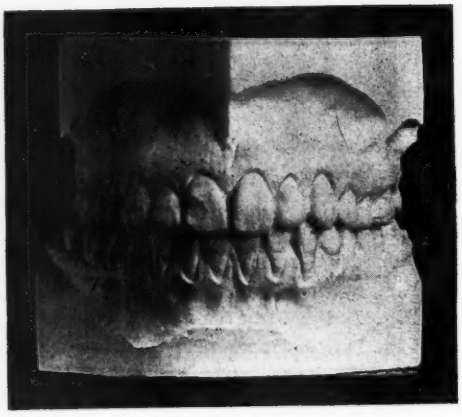


Fig. 6.

where credit is due. All these appliances Dr. Dewey showed on the screen embody the principles of Dr. Walker, especially the claw. He used it mostly on molar teeth.

To begin with, you must rely entirely upon the patient's interest in wearing the appa-

ratus. Some of them wear the apparatus consistently and conscientiously, but I have had others tell me that they would put the appliance in their desk or pocket. Often at the time you expect them to come to the office with the appliance on they say, "Oh, I forgot

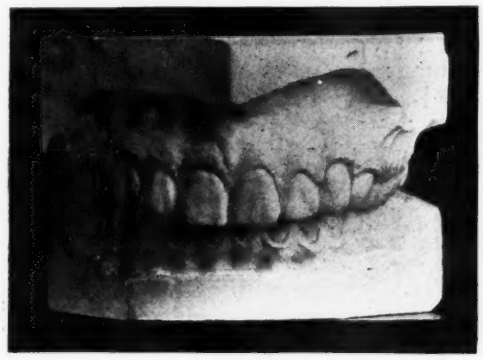


Fig. 7.

Fig. 7.

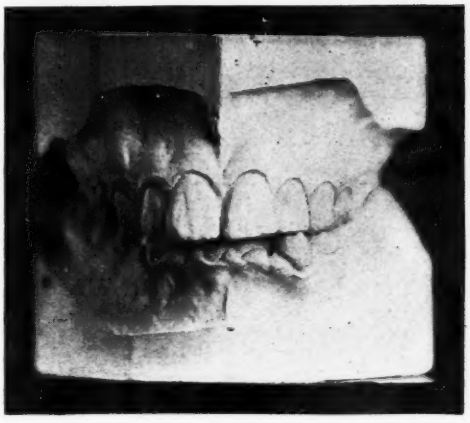
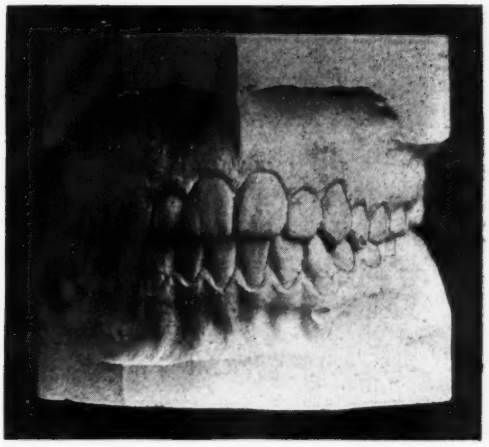


Fig. 8.



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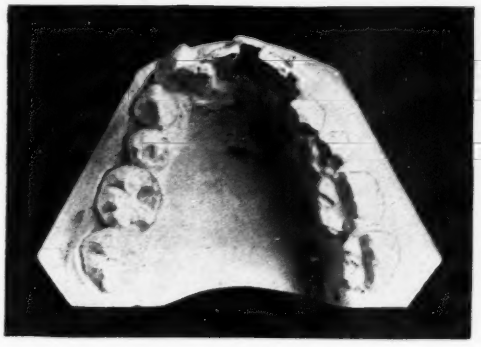

Fig. 9.

Fig. 9.

it." Then will run down into their pocket and get it. That is one of the greatest objections.

So far as cleanliness is concerned, that is up to the patient. Often with cases I have treated just under the claw attachment in the molars there would be white spots at the gingival border showing the patient had not properly cleaned them. I have also used this

appliance as a retainer which the patient would wear for two or three years and then be horrified to see how dirty they were. One of the patients, who wore this kind of an appliance was a young lady of a fine family—her father the president of one of our largest universities of the south.

The keynote of all appliances should be simplicity, but this appliance is far from simple. It is a beautiful apparatus for a patient to wear as a retainer provided you can get him or her to wear it as instructed. Also remove and replace properly.

Dr. Dewey (closing).—Very little discussion is necessary except to say that this is not a retaining appliance, and to my mind it is not suited as a retaining appliance.

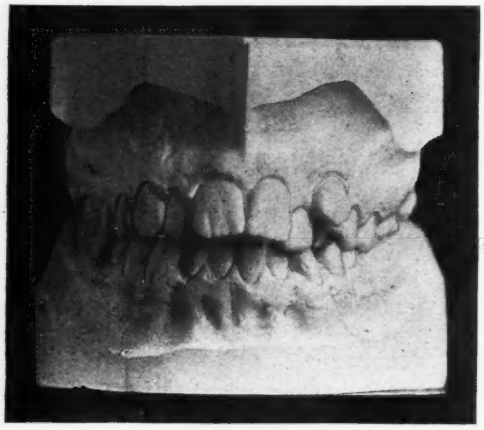

Fig. 10.

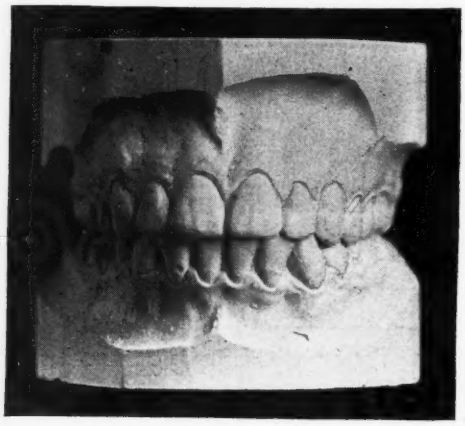

Fig. 10.

Fig. 11.

Fig. 11.

The last speaker stated that when he took off a certain removable appliance he was surprised to see how dirty it was. A fixed appliance is as dirty when you take it off as a removable appliance, and there is less probability of a fixed appliance being taken off and cleaned as often as one that can be removed easily.

The prophylactic feature of the appliance has been practically agreed upon by periodontists who have seen it. The absence of bands and the absence of gingival irritation when the appliance is removed are points in its favor.

Because of the clasp designed by Dr. Walker and used by Dr. Crozat, myself and others,

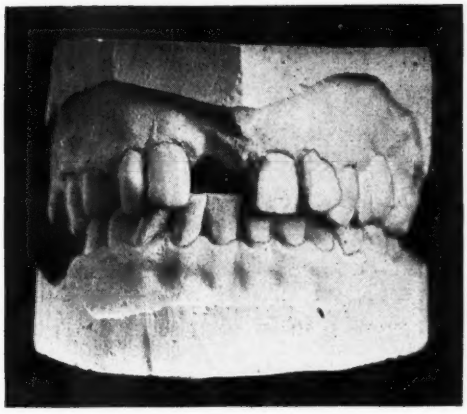

Fig. 12.

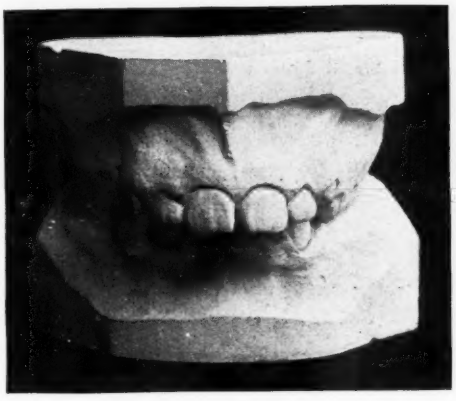

Fig. 13.

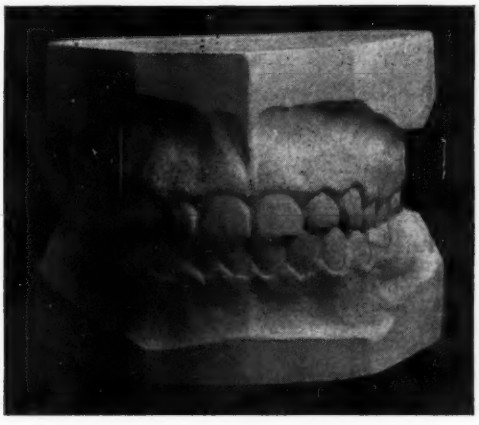

Fig. 13.

when that appliance is removed everything is off the teeth. Dr. Gorman said it was not a simple appliance. It is about as simple as anything you can get and be efficient. It is certainly not as complicated as a lot of things that are placed on the market and sold by the dental dealers. You have to master the technic of making the appliance, which is simple, and if you use it you will become as enthusiastic as others. If you have not mastered the technic, then you think it is a complex appliance.

SCIENTIFIC SESSION, SOCIETE FRANCAISE D'ORTHOPEDIE DENTO-FACIALE, SATURDAY, JANUARY 7, 1922.

Opening Address by Dr. Leon Frey, Honorary Chairman

THE meeting of the winter of 1922 was held in Paris at the Faculty of Medicine, Dr. Leon Frey who is in charge of the courses at the Faculty of Medicine acting as honorary chairman.

Gentlemen: Toward the end of my career, I at last have the great satisfaction of seeing the ideal of my life, namely our professional and scientific unity, becoming gradually realized.

At the close of the year of 1916, our allied Congress made a splendid showing of it; which showed its possibility with a great clatter. After the armistice, each group took its previous position but with an entirely different spirit than formerly; the controversy was ended or at least it was far less bitter and narrow, because courtesy of relationship set the fashion everywhere.

Several days ago an interesting ministerial commission composed of our dean, professor of the faculty, stomatologists and odontologists, reunited to try to establish the basis of the unity of origin for all the specialists of the dental art. What a good symptom! You may rest assured that whatever be the formula used, success is at hand.

During the war, our unity in this admirable work which was known as "Fraternal Aid" was often very touching. I recall that Cruet set the example of this spirit of unity by his active generosity during the war. Yesterday our excellent Fontanel, who, together with Viau, forms the soul of the Fraternal Aid, told us that we have been able to adopt 23 orphans whose ages range up to twenty-one. He then asked us to make an effort to accept three more, who were the children of a heroic compatriot, a surgeon dentist, named Hess, who was shot by the Boches in Belgium. We, the members of the committee, assured him that our appeal to the entire brotherhood in behalf of so worthy a cause, would not be in vain and we have decided to raise the number of orphans accepted to twenty-six.

Thus, gentlemen, I hope that the morrow will bring unity for establishing identity of origin, unity for assisting war victims and finally, unity for furthering scientific production in our art by enabling our research workers to earn their existence by their works at the "Laboratory." I do not think myself indiscreet when I say that a project that is in the actual state of formation, does not take long to materialize.

Lastly, our dear friends, Pont, de Nevreze and Quintero have now set us a new example of unity by inviting us all, stomatologists as well odontologists, to the Faculty of Medicine of Paris to participate in the doings of the Societe Francaise d'Orthopedie Dento-Faciale.

*Read before the Societe Francaise d'Orthopedie Dento-Faciale, at Paris, France, 1922.

Now for my own part, allow me to thank you heartily, you have offered me the honorary chairmanship with such touching insistence that despite my ill-health, I could not think of refusing you, dear friends, let me thank you once more, for it is to you that I am indebted for the possibility of being able to proclaim here, that our professional and scientific unity is become more and more of a reality.

And now for some work. Thus in accordance with the issue of the day, with your kind permission I shall read several generalities on the etiology of malocclusion due to malpositions and malformation of the teeth and the maxillæ.

DENTO-FACIALE ORTHOPEDICS*

General Etiology of Malocclusions due to Malformation and Malpositions of the Teeth and the Maxillæ

By Dr. Leon Frey, Paris, France.

(*Translated by Margaret Gortikov, D.D.S., New York.*)

IN this general study of malocclusions, the etiology is extremely complex, and can only be complete after an analysis of all the elements both local and general, which compose it, are involved in it, and act one against the other in order to establish malocclusion.

Local Causes

I. TEETH

The case is simple. In this instance, the malocclusion is caused by irregularities of one or more of the teeth, the maxillæ and temporomandibular articulation being normal.

All the irregularities of the teeth can produce one or more types of malocclusion; they are simple if the tooth is malposed in but one direction but they will be complex if the irregularities occur in a transverse, anteroposterior and also a vertical direction all at one time.

These irregularities are abnormalities of forms (too large or undersize incisors, canines and molars or even irregularities of form due to concrescence.) There are also irregularities in the number of teeth such as missing teeth or supernumerary teeth; there also is faulty position (transposition in the arch, displacement outside of the arch) due to malpositions of the tooth germ Gaillard[1], Zsigmondy[2]. The odontomas and adamantinomas whether solid or liquid, either by concealing the teeth in the arch or by displacing them in the arch, all come under the heading of malocclusions due to irregularities of the teeth.

Among the causes of the irregularities of the teeth producing malocclusion, we can add the premature loss of the deciduous teeth and loss of the permanent teeth whether it be following extractions or following disintegration of the crown, the roots having been reached by caries or involved through traumatism.

The loss of deciduous teeth can likewise disturb normal occlusion of the

*Communication presented at the Societe Francaise d'Orthopedie Dento-Faciale Orthopedia on January 7, 1922.

permanent teeth. In the same manner tardy eruptions of the permanent teeth allows those already erupted to assume faulty positions, thus producing malocclusion.

Now as to the bad habits of childhood[3] (thumb-sucking, lip-sucking, biting of the cheeks, lips and tongue) they not only lead to malocclusions, due to irregularities of the teeth, but also due to action upon the maxillæ when the malleability of the bone favors it. (See "Maxillæ" below.)

Faulty muscular pressure in mouth-breathers and in those whose tongues have been excised (partial or total excision)[4] is another cause.

Whatever the dental cause may be in this particular case, faulty occlusion is always due to abnormal movements of the teeth and these can be divided into three types.

(a) Transverse movement about a horizontal axis passing through any point of the tooth.

(b) Anteroposterior movement parallel to the normal axis of the other teeth.

(c) Rotatory movements about a vertical axis passing through the tooth[5].

Transverse movement according to direction, that is, whether toward the lip, tongue, mesial or distal sides, are described by the terms labioversion, linguoversion, mesioversion and distoversion.

The anteroposterior movement according to its labial or lingual position in relationship to the arch, according to its mesial or distal motion in it, and finally its vertical movement that is either being deeply embedded in the bony arch or growing longer than normal, are defined by the terms:

Labial-gression (labial occlusion); lingual-gression (lingual occlusion); mesial-gression (mesial occlusion); distal-gression (distal-occlusion); infra-gression infraocclusion); supra-gression (supraocclusion).

Now as for the rotatory movements, according to whether the tooth, surface or border, is more specially turned toward the labial or the lingual, are termed:

mesial-rotation* or distal-rotation	either	labially or lingually

II. ALVEOLAR PROCESS

Alveolar atrophy and hypertrophy can interfere with occlusion and be the origin of malocclusions, particularly infraocclusion and supraocclusion.

Here we will only consider the cases of atrophy and hypertrophy that are independent of the tooth, because in a general way the alveolar process is the result of the function of the tooth, being developed with it and becoming absorbed after its loss.

These are but a few cases that are known as independent alveolar atrophy and these are due to sclerosis of the tissue following chronic abscess of the deciduous teeth; in these cases the alveolar process does not follow as it ordinarily does, but on the contrary undergoes atrophy due to atrophying sclerosis of

*All known as torsi-version. There may be combinations such as torsi-mesio-version and the like. M. G.

the process which causes the permanent teeth to assume faulty positions or even prevents their eruption. (Zsigmondy.)

When occlusion is disturbed because of tardy loss of deciduous teeth or by insufficient development of the permanent teeth, the alveolar process at the level of these teeth always presents a slight degree of atrophy in comparison to the surrounding alveolar region but then the atrophy is due to an arrest in the development of the tooth.

Independent alveolar hypertrophy is only found in young patients and in the two following cases: After extraction of a tooth, the occluding tooth which has lost its entire occlusal contact, does not grow longer in its alveolus by elongation as it does in older patient but its alveolus proliferates and leads the tooth more or less toward the opposing alveolar border, sometimes almost making it touch it.

The same occurs in the second and third class of Angle when the mandibular incisors have no teeth with which to occlude and their alveolar processes grow in height, sometimes in an excessive manner; the teeth themselves show absolutely no elongation. Thus, it is not they which "elongate" to use a term which is generally employed incorrectly.[6]

III. MAXILLAE

When the maxillæ, and temporo-mandibular articulations are abnormal then the malocclusions caused by them always represent very complex clinical cases.

Note.—First of all, it is well to remember here that in the jaws of the newborn, strictly speaking, the region of the dental follicle has great advantage over that of the maxillary bones; thus it is that in the upper jaw, the follicular region reaches the roof of the orbit while in the lower jaw it only leaves a simple border to the bone itself.

So it is that we ought to conclude that the development of the maxillæ is at least in part a function of the teeth and that a follicular atrophy more or less generalized will involve a more or less extensive atrophy of the maxillæ.

However, it is well to observe that the dependence is not limited as much to the bony structure of the jaws as to the alveolar process.

CONGENITAL MALFORMATIONS

Mandibular, atrophy. Let us notice the complete congenital atrophy of the mandible (micrognathia, jaw of a bird) resulting from atrophy of the lower maxillary bud[7].

Sometimes complete atrophy may follow congenital temporo-mandibular ankylosis[8]. Congenital hemiatrophy (hemignathous) has been described by Burger, Moxhey, Kirmission, etc.

Between the micrognathia and the agnathia (total abscence) several intermediary conditions have been noticed[9].

Mandibular hypertrophy. Congenital hypertrophy of the mandible most often reveals a more or less accentuated type of prognathous, prognathous generally being a family trait[10].

Note.—Here we wish to assert that no relationship exists between this lower prognathous, teratologic phenomena and the normal ethnic prognathous

or racial prognathous to which the anatomists and anthropologists attach an entirely different significance. As to these last, the prognathous of race measures the relative importance of the facial and cranial portions in the skull; this word is synonymous to the term, relative obliquity of the two maxillæ, in opposition to the word "Orthognathous" which represents the ideal rectitude which no race has attained. The anthropologists above all, have studied the variations of superior alveolar-subnasal prognathism, because the development af the mandible is not as intimately connected as that of the maxillæ, with the cranial formation.

Congenital atrophy involves lower distal malocclusion of Class II (Angle) the prognathous is characterized from an anteroposterior view, as a Class III (Angle) (lower mesial malocclusion). As to the hypertrophy of the mandibular angles which is a family trait,[11] it has been observed in some cases and may be called mandibular hypergnathism which scarcely interferes with malocclusion.

Maxillar atrophy. In the maxilla, notice the faulty development of the nasal process, micrognathia of the incisal region and sometimes you will find atrophy of the entire maxilla accompanying it (micromaxillary development, hypognathous). Consequences: lack of occlusion with upper distal malocclusion Class III (Angle).

Congenital atrophy with the oval palatine vault (V-shaped arch) has been particularly studied by the Frere (The Neuropathic Family, 1898); by Gŏurc (Amygdale of Myer; Thése, Paris, 1897); by Galippe (Study of Heredity of Abnormalities of the Maxillæ and the Teeth, 1902, and loco citato 1905), but these authors as well as Magnan have been wrong in being too exclusive; above all things they include degeneration and premature ossification of the base of the cranium; many of these cases are acquired deformities.

ACQUIRED MALFORMATIONS

Let us note in but a single line, all the malocclusions due to faulty unity following fractures.

Mandibular, atrophy. The lower maxilla may present complete atrophy (micrognathia) following osteomyelitis in young patients. In October, 1915, Mauclaire presented at the Surgical Society, a young man of twenty-six, who when he was six years of age, had osteomyelitis of the limbs and the mandible which remained slightly atrophied.

Acquired hemiatrophy of the mandible, following acquired temporo-mandibular ankylosis or a constriction, has been observed by several authors such as Poisson, Helferich, Alexander, Orlow,[12] etc.

In his Review of Orthopedia in 1903 Mauclaire called our attention to a case in which infantile hemiplegia at the age of three was followed by hemiatrophy, the result was a slight atrophy of the entire corresponding half of the body.[13]

He has also noticed hemiatrophy following noma, in a young child. Extensive and deep scars may produce more or less atrophy of a child's maxilla.

Mandibular, hypertrophy. Prognathous of obstetrical origin through faulty presentation and consequent deformity of the mandible has been described, particularly following exaggerated opening at the angle.[14]

Hypertrophy of the tongue may produce a more or less extensive and symmetrical hyperconvexity of the mandible. The results of these acquired deformities of the mandible, from an anteroposterior standpoint of malocclusion, are those we have seen above in connection with congenital deformities. It is well understood that the malocclusions in a labio-lingual and a vertical direction, are also included.

Mandibular, simple deformities. In the bony region predisposed (rickets, see general causes further down) to deformities due to mechanical causes, mouth-breathing in particular has produced malocclusions which have been pointed out by Jules Ferrier.[15]

Frey and de Nevreze in 1909[16] have already described a special deformity characterized by an exaggerated opening of the angle, known as mandibular obtusism and according to Case[17] can be accounted for by the contraction of the suprahyoid muscle during sleep. These muscles draw down the thin extremity, while the ascending branch is fixed by the tonicity of the elevators (temporals, masseters, internal pterygoids) the angle opens, producing more or less of a lack of occlusion. J. Ferrier has added to this deformity the enlargement of the lower border of the mandible in consequence of the predominating action of the masseter over the internal pterygoid producing a lever with more or less accentuated movement; the lower border of the mandible tends towards mandibular anteversion and the teeth present a certain degree of linguoversion.[18]

Maxilla. The acquired deformities of the maxilla are of the simple variety or they may be the result of atrophy of this bone;[19] more rarely it may follow hypertrophy.

Simple deformities without atrophy. In a mouth-breather who holds his mouth wide open especially during sleep and in whose mouth the bony predisposed region is quite extensive, the skin and muscles of the face are naturally stretched. Ferrier says that the temporal muscle ought to flatten and lower the large region in which it is inserted, the masseter ought to lower the cheek bones (malar and zygomatic) while the internal pterygoid, by means of the pterygoid process ought to lower the lateral portions of the sphenoid.

Result. Reduction in size of the transverse diameter of the base of the cranium, and the maxilla, compressed by its soft tissues, likewise undergoes this transverse reduction; its lateral parts are flattened, its alveolar border is lowered; the palatine process, says Ferrier, is held between the alveolar mass which compresses it, and median border of the opposing process which for its own part undergoes the same pressure in an inverse sense; thus this process can only be raised and so produce the oval vault (V-shaped arch). The bony wall separating the nasal fossa is held between the resistance of the base of the cranium and the pressure of the palatine processes or presses down the pliable border of these and forms a median process which is more or less accentuated in the buccal cavity or deviates into one of the nasal fossa or again presses forward the bones proper of the nose, thus producing a specially characteristic profile.

The malocclusion following this deformity of the maxilla is principally an upper lingual malocclusion in relationship to the occlusion; in general it is

especially accentuated in the premolar region; very often, this malocclusion involves overlapping of the teeth, however, the occlusion remains normal in the anteroposterior directions. (Class I Angle.) The teeth often protrude labially and then the occlusion, in an anteroposterior sense becomes an upper mesial malocclusion (Class II Angle), finally the lowering of the alveolar border may lead to a supraocclusion of the molars with a more or less marked lack of occlusion in the incisal region (open bite).

Jules Ferrier has well shown (Review of Stomatitis, June, 1914) that by modeling the oval vault in sheet wax that this deformity is purely morphologic, a simple change of form due to external action on the normally developed maxillæ; there is no atrophy of the bone "diminution of the substance," "the air in the vault remains constant."

Following the same line of thought, let us notice the deformities caused by bad habits (particularly, sucking of the thumb, resting against the palate which having but little resistance in young subjects, is pushed forward and upward by it) by faulty muscular equilibrium in those whose tongues have been excised.

Maxilla, Atrophy (acquired). Deep and extensive scars atrophy the bone locally and deform it. Dr. Aime, radiographer of Val du Grace, has, during the war, shown the profound disturbances of nutrition that manifest themselves in the bones, whether they themselves be traumatized or whether the traumatism has occurred in surrounding parts.

Pradal, in his thesis on the bony atrophies called "Calcaires," calcareous matter, (Montpellier, 1921) has well demonstrated that after certain traumatisms of the limbs, its penetrability by the x-ray was much greater than normal.

There would be not only decalcification, but also rarefaction, thinning of the plates, the bony structure undergoes a complete transformation. The same thing occurs in infected nerves (Aime) in certain muscular disorders. Lerebonllet, Izard and Mauzon presented at the Medical Society of Hospitals on Nov. 10, 1920, a patient suffering from myasthenia and showed symptoms of bony disorders about the large facial, especially in the maxillæ in which the incisors were considerably in labioversion. The radiograph showed a progressive resorption of the entire maxillæ.

If mouth-breathing deforms the maxillæ which have been normally developed, as has been shown above, that is the bone not having atrophied, there are numerous cases in which nasal obstruction has prevented the bone from completely developing and this was due to a local atrophying influence. B. Delevan gave experimental proof of it by artificially obstructing one of the nostrils of a rabbit; he subsequently established undeniably very distinct cases of cephalic asymmetry. This fact somewhat resembles that which occurs in the orbital cavity of young patient's after enucleation of the eyeball, if an artificial eye is not continually held in its orbit, in adult age, half of the face of the side operated upon, presents smaller dimensions than that of the healthy side Medical Congress of London 1913).

Helbron[20] has come across cases of maxillary atrophy following facial paralysis arising during infancy. This facial paralysis was accompanied by

disorders of the sensory and motor branches of the trigeminal. Schiff, after section of the inferior maxillary nerve[21] has obtained in the corresponding bone atrophy and hypertrophy at the different times. Thus we could at one time invoke muscular flaccidity and trophic disturbance.

Maxilla (acquired hypertrophy). It sometimes happens that the maxilla is spread out to a certain extent. I had the opportunity of verifying this in two old ricketics and explain it by the fact that the action of the mandible, which is the denser, has caused its antagonizing maxilla to yield progressively when occluding; the maxilla being less resistant, and more ricketic. Consequence, superior labioversion, and it may be so exaggerated as to interfere with the occlusion of the teeth producing a lack of occlusion while the mandibular teeth remain normal.

IV. TEMPOROMANDIBULAR ARTICULATIONS

The malocclusion following abnormalities of the temporomandibular articulation are not rare and from a diagnostic standpoint several of them present an interest of real importance for an easy and rapid cure.

There are congenital deviations due to malformation of the articulation; these cases are extremely rare. The more frequent cases are those acquired deviations of articular, muscular cicatricial or finally dental origin.

The acquired irregularities are of articular origin when they are due to dislocations which have not been reduced, in conjunction with different forms of arthritis, and also to simple displacements subsequently maintained by dental evolution. In this respect, the case that Mr. Stanislas Bobo presented to the Association of the Dental Institute at Nancy is absolutely characteristic,[22] it concerned a young child of about two and one-half years of age, who slept on a much raised pillow, thus causing the head to be bent in an exaggerated manner; in this instance (muscular resolution during sleep being almost complete) the mandible, compressed between the maxillæ and the anterior region of the neck, was found displaced forward due to a sliding forward motion. This frequent and prolonged faulty position somewhat modified the relationship of the temporo-mandibular articulations so that the two mandibular central incisors were anterior to the maxillary thus maintaining a lower mesial malocclusion (Class III Angle). It was sufficient to use a low pillow which allowed the child's head to be slightly thrown backward, so as to disengage the mandible and gradually lead it back to normal occlusion. In two months time the cure was complete and final.

Thumb-sucking, aside from the deformities shown above, may produce a forcing backward of the mandible by a sliding backward motion, thus causing a distoversion of the mandible (Class II Angle).

The acquired abnormalities are of muscular origin when following contractions or paralysis of the levators, depressions and compressor muscles.[23] They are generally characterized by lateral sliding movements which involve complex malocclusions with a lack of occlusion. At the orifice, the mouth presents an abnormality seen in "the village chorister" and this may, according to the case, become complicated with "mesial" or "distal" malocclusion (Maurel).

In tonsillar hypertrophy, it may happen that the child, by endeavoring to develop a laryngeal respiration, obliges its muscles to slide the mandible forward and produce a state of false prognathism with lower mesioclusion, (Class III Angle) (chin in rubber[24]).

The acquired deviations may again be of cicatricial origin; following deep burns of the neck of a child of six. J. Tomes[25] has found a very marked retroversion of the mandible due to the fibrous retraction and even being complicated by a certain amount of curvature of the bone. During the war, we observed cases like this in many of our wounded and burned.

Finally, the acquired deviations are of dental origin whenever the mandible undergoes a forward, lateral, or backward movement due to maxillary malposed teeth. If the maxillary central incisors, due to faulty development are in linguoversion, the mandibular incisors evolve in a lower mesioversion and slide forward anteriorly to the maxillary thus involving the mandible in an anteroversion (Class III Angle).

If the maxillary incisors are in pronounced linguoversion they may, in occluding with the mandible, force it backward by a backward sliding motion. (Class II Angle.)

If the maxillary incisors, canines and even premolars on the left side (for example) are in linguoversion, the opposing mandibulars evolve a buccal (or labial) version thus involving the mandible in a lateral-sliding movement.

GENERAL CAUSES

All the local causes of malocclusion that we have just reviewed, are, in some way, the mechanical causes; but beneath them all, it is the general causes that determine and predispose them.

HEREDITY

Normal heredity. The dolichocephalic, with narrow nasal passages if he has adenoid tumors, is led to mouth-breathing and its consequences because his nostrils are more easily obstructed than those of the brachycephalic with large nasal openings.

Teratological heredity of the bony affections common to the family is characterized by disturbances in the process of ossification.

1. Achondroplasia, where there is a predominance of periosteal ossification over the cartilaginous ossification, may lead to deformities which tend to end in shortening of the limbs. The condyles and basilar portions of the occipital bones are greatly reduced in size.[26] Where widening of the membranous part of the skull, with exaggerated increase of volume of the cranial cavity and receding of the nasal portion of the face, the mandible remains normal, consequently, there is superior distal version (Class III Angle); it is a case of Tourof achondroplasia.[27] When the skull is not affected or only slightly deformed by achondroplasia, then the upper maxilla remains normal (personal observations of Frey).

2. Cleidocranial dysostose (Pierre Marie) contrary to achondroplasia is characterized by a predominance of cartilaginous ossification over the periosteal ossification[28] the clavicle is the only long bone not ossified, the

skull bones, which are thinner, being incompletely ossified; while the bones at the base of the cranium are relatively atrophied in achondroplasia and where there is receding of the nasal region in cleidocranial dysostoses, on the contrary it is relatively predominating and there being a projection from the upper part of the face forming a "bird's head." Consequence, upper mesial malocclusion (Class II Angle).

In Frey's personal observation, this malocclusion was little marked, but there was a lack of occlusion due to insufficient and irregular development of the teeth and alveoli.

3. Cranio-facial dysostosis[29] is characterized by a malformation of the skull in a keel form, the anteroposterior crest overhanging the frontal protuberance, and malformation of the forehead in form of an angle, brachycephalic and enlargement of the root of the nose which becomes more or less arched manifest themselves, also ocular symptoms, exophthalmia and squinting; you can also find more or less serious lesions of the optic nerve, the whole is in relationship to a premature synostosis of the bones of the cranium. Finally, the authors describe a reduction of the large facial with prognathism of the mandible; at Bicetre, Frey, in 1920, observed a child, W., ten and one-half years of age who answered to this type; with normal form and normal teeth yet the maxilla proved to be insufficiently developed in an anteroposterior sense as well as transversely, the malar bones being very prominent, reduction of the large facial; this maxilla is inscribed in the mandible which is normal, whence we get the appearance of false prognathism associated with distoversion of the maxillæ (Class III Angle).

4. All the other family dysostoses which are not classified are not of interest to us, as the preceding for instance, except when they impede normal development of the jaws and thus malocclusion results. Let us observe the following: osteopsathyrosis or essential bony fragility, the bones generally end by becoming strong at puberty, osseoleontiasis, hyperostosis, diffused progressively, oxycephalia, whose limits Bertolotti widened by making of it an extensive bony dystrophy of the skull and face, and being on an equal footing with several other deformities of the skeleton,[30] etc.

5. Due to Galippe (referring to pp. 251, 253 and 255) we attribute to teratological heredity all the abnormalities of the teeth (irregularity of form, number and position) which, we have seen, are the direct factors of malocclusion, the same applying to the congenital atrophies and hypertrophies of the maxillæ. From this point of view alone do we agree with the ideas of this master as well as those of Magnan and Fere. "Not only," said Galippe, "are the irregularities being reproduced continually, but they are even transmitted in a worse form. If one of the direct ascendents has maxillary lateral incisor that is smaller than normal, for example, then the chances are that in the child the two lateral incisors will be smaller than normal or one will be missing. Very often there is a complete absence of both incisors in the third generation."

Note.—Paget's malady, a progressive chronic osteopathy characterized by thickening of frail, seeming to be localized in the long bones and those of the trunk and the cranial cap, though Andre Leri has described it in

the small bones of the extremities and in the base of the skull. (New Oconography of Salpetriere, Jan., 1923, and the November and December, 1913) Leri has shown that the deformities of the base are due to softening of the tissue, but Frey, by examining several pagetics in 1920, has not ascertained any deformities of the maxillæ and thus no malocclusions. These deformities are possible nevertheless and it is worth while paying attention to this special point.

Pathologic Heredity. The influence of hereditary syphilis is not to be overlooked among all the local causes mentioned above, whether it acts directly upon the teeth, maxillæ, or temporo-mandibular articulation by disturbing their evolution or by altering their structures, or whether it acts indirectly on the region. (See rickets further down, the reactions of defense at a distance, being stimulated by the chronic toxic infections.) Thus we have heredity of syphilis as a directly determining or indirectly predisposing factor.

Alcoholic heredity and tubercular heredity act through the region; they stimulate in the embryo, newborn child, or even adolescent, reactions or defense, endocrine trouble (glands of internal secretion) predisposition to infection and trophic disturbances which react on the development of the teeth, jaws and on their structures and consequently tend toward all the local causes of malocclusion.

RICKETS

We have just seen the influence of heredity from three aspects, normal, teratologic and pathologic. Now let us devote our special attention to rickets which occupies a place of the first order among the general causes of malpositions. We consider rickets from an etiologic standpoint according to Marfan's conception.[31]

Rickets is the result of infections and chronic intoxication (toxic infections of a digestive type, syphilis, tuberculosis, prolonged bronchopneumonia, chronic syodermetis, etc.) which arise during the active periods of ossification. These infections and these intoxications stimulate reactions of defense in the bony tissue, which reactions may be generalized in the other hematopoietic organs, particularly in adenoid tissue (lymphatic ganglion, palatine and pharyngeal tonsil) and sometime even in the spleen. We must remember that in the very young the differentiation of the various hematopoietic organs is less noticeable than later in life.

In the first stage, the reaction against infections or chronic intoxications is manifested in the bone marrow, very active in the young child or fetus (that is to say at a period when the tissues react without measure) especially in certain predisposed individuals (Marfan) due to vascularization and intense proliferation of the marrow, stimulating a resorption of the fundamental substance of the bone, period of rarefaction, of medullization, (Marfan). In the second stage, the medullary reaction stops by a sort of draining and the process of ossification recommences but the osteoblast, doubtlessly participating in draining the marrow, remains without prolongations and elaborate imperfect ossein; an osteoid tissue is formed which replaces the red marrow and rests against all that remains of the old bone and constituting

that which J. Guerin called spongoid tissue but which Marfan calls fibrous or fibroid tissue. In the third stage, there occurs a reparation characterized by a resumption of the normal process of ossification, by a reappearance of the red marrow and a transformation of the spongoid tissue into a compact tissue that is harder and whiter than normal bone, eburnation, (Marfan). In ossifying, the bone tends to resume its normal form but it only does so incompletely, the deformities remaining more or less marked.

These indications allow us to understand how, in the course of ricketic evolution, the maxillæ undergo local malformations which we have studied above and which involve malocclusions.

ALTERATIONS OF THE NUTRITION

(A) By endocrine disturbances.

(B) By faulty alimentation.

Here, for one part (A) the products of secretion of the glands of internal secretions (endogenous hormones—I excite) are either lacking or insufficient for the general nutrition and development of the individual.

On the other hand (B) there is a faulty alimentation, that is a loss of vitamines (exogenous hormones) which become pathogenetic to the general nutrition and development of the individual.

(A) Athyroideus is characterized by a myxedema, In the disease the two dentitions are sometimes of no force, very often being extremely irregular and incomplete. The teeth are of smaller size, thus malocclusions are the rule.

In hypothyroideus, the same occurs but in a somewhat more attenuated form (Leopold Levi).

(A) Pituitary body tumor, with enlargement of the sella turcica determines this particular growth of the skeleton known under the name of acromegaly (Pierre Marie) and characterized, in that which concerns us, by a development, enormous at times, of the two maxillæ, sometimes especially of the mandible, in this case, there is anterior (mesial) malocclusion (Class III Angle) with more or less of a lack of occlusion.

(B) In the maladies due to an absence of vitamines, Weill and Mourequand[32] have almost exclusively described the manifestations of scurvy, beri-beri and pellagra, without making mention of the disturbances in calcification.

However, as regards the etiology of caries, we know the experiences of Wells[33]; also the works of Funck and especially of Edward Mellanby[34] the latter, through the clinic and experimentation has established undeniably the bony lesions which he calls ricketics and which he attributes to the absence of liposoluble vitamines[35] "Fat soluble A" of American and English authors in opposition to hydrosoluble vitamines, "Water soluble B," more especially responsible for beri-beri and scurvy.

The question is still not to the point, but avitaminosis ought to be observed here as a factor of faulty calcification from point of view of rickets; perhaps it is even an agent of rickets, to add to the etiology by Marfan.

CONCLUSION

Such are the generalities that we wish to place before you on the etiology of malocclusions. I repeat it to you; it is through work of very minute analysis of all the etiologic elements concerning each observation that we can make a clinical synthesis. The etiology thus established, determines a rational treatment.

In closing, I wish to repeat Bacon's words: "Homo potest quantum scit." Our therapeutic possibilities are the functions of our knowledge, I will add here, particularly, of our etiologic knowledge.

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DEPARTMENT OF ORTHODONTIC TECHNIC

Edited By
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ELEMENTARY ORTHODONTIC TECHNIC

By H. C. Pollock, D.D.S., St. Louis, Mo.

(Continued from June issue.)

MATERIALS FOR LABIAL ARCH WIRES

BASE METALS:—The general discussion of base metals as appeared previously in these pages under the head of "Materials Used for Plain Molar Bands" applies equally well under this heading of "Materials Used for Labial Arch Wires."

Base metals for this purpose, while having been used quite extensively in years past, at this time bear about the same relation to modern orthodontic technic for this purpose as does the formerly well-known fabric automobile tire to the modern and more efficient cord. The fabric equipment did very well, but plainly the cord tire surpasses it in every possible manner and detail.

Among the principal objections to base metals used for this purpose, and which might be mentioned of primary importance, are its susceptibility to oxidation and corrosion when in contact with the saliva of the mouth, and, as a result of this reaction, the appearance of the wire when in the mouth is unclean, unsanitary and not the least pleasing to the eye. Instead of presenting the appearance of an efficient and well finished piece of material, the base metal labial wire appears decidedly unfinished and out of place in the oral cavity. It looks and acts more like a brass finger ring on the finger or phony diamond in a Tiffany setting.

Another serious objection to the use of the same, which can be mentioned, is its inability to successfully withstand high temperature which may be necessary for the purpose of soldering attachments and spurs to the wire without entirely losing its elasticity. It has therefore become the practice in the past, when soldering necessary attachments to base metal arch wires, to use soft jewelers' solder which flows at a very low temperature. Moreover, it is a decidedly unsatisfactory practice and such attachments are always unsightly as well as many times being inefficient as to security of attachment.

Another objection which may be pointed out is the elasticity of the usual base metal, being of such a character that it becomes necessary to employ a large diameter of wire for use as compared with the same elasticity which may be secured by the use of small, delicate, precious metal labial wires. The result, in the use of base metal then, is a large, bulky, and unsightly appliance which is entirely unnecessary at the present time, considering the other materials which are available for this purpose.

PRECIOUS METAL LABIAL ARCH WIRES

For the above purposes precious metal is used almost entirely at this time, it being used in various combinations of the alloys, of platinum, gold iridium, palladium, and even molybdenum has been used with some degree of satisfaction. Manufacturers are perfecting these combinations of alloys until most efficient and satisfactory materials may be secured from manufacturers for the purpose under consideration, in many and varied sizes ranging from a very large size of .050 of an inch, all the way down to .018 of an inch in diameter, in the considerably used round wire. These wires are not always utilized, however, in the round wire form. The flat or ribbon type, the half round, and the oval have become equally popular among some operators.

TYPE OF LABIAL ARCH WIRES

Round Wire.—The round wire has been largely referred to and in previous pages it has been featured as the most typical of the forms of labial arch wire and is accordingly the original stem from which have sprung the various modifications in both materials and forms which have followed in use more recently, and if we are again to be governed by the majority, as exemplified in the practices of the orthodontists, the round arch wire still unquestionably and easily holds first place in forms used.

The Oval Wire.—The oval wire it is claimed has the added advantage over the round wire in that when fitted to place the lesser diameter of the wire in one direction permits of a closer adaptation to the teeth, accordingly it can be adjusted to place in such a manner as to offset a certain amount of bulk to interfere with the lips and cheeks. It is more easily bent and manipulated inward and outward to conform to the malocclusion of the various teeth, and incidentally is slightly less conspicuous. A more significant advantage to the oval however, in cases where indicated, is the mechanical attraction gained in that the oval wire engaged in a correspondingly oval buccal tube as it is used does not permit rotation of the arch wire within the buccal tube after the wire has been fixed to the teeth. As a result of this mechanical feature when the anchor teeth are thus moved by pressure or energy exerted by the arch wire the anchor tooth must necessarily move in mass, the roots along in conformity with the crown of the tooth. The anchor tooth cannot tip in the buccal or lingual direction because the oval arch wire is unable to rotate in the corresponding oval tube in which it is engaged. The arch wire is sometimes used, being constructed oval on one side of the dental arch and round on the opposite side. It is obvious that the anchor tooth being engaged in the oval tube will exert greater resistance to force applied than will the anchor tooth

in the other side of the mouth being engaged in the round tube. The tooth attached to the round tube will tip while the tooth engaged in the oval tube must move entirely at right angles to its long axis. In cases then in which it is desired to cause more lateral movement on one side of the dental arch than it is on the other, this principal may be employed to advantage. (Fig. 25.)

The Flat or Ribbon Arch.—The ribbon arch as advocated and perfected by Angle is one that has come into prominence during the last few years and is being used quite extensively by many orthodontists and has added to orthodontic technic some mechanical features which are most desirable and which heretofore have not been utilized in any other form of mechanical device. Its principal feature may be pointed out in short by excerpts at random from the writings of Angle in his descriptions of this device. To quote therefrom in part:

Fig. 25.—Julius Aderer's clamp band for bodily movement of molars. (Dewey.)

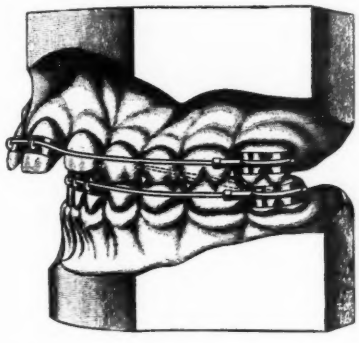

Fig. 26.—Ribbon arch and brackets adjusted for the treatment of distoclusion. (Dewey.)

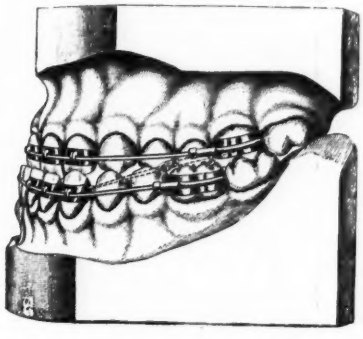

Fig. 27.—Ribbon arch and brackets adjusted for treatment of mesioclusion. (Dewey.)

"This mechanism is of course based on the excellent main principle of the expansion arch given to us long ago by that great Frenchman, Fauchard, whom especially all orthodontists are honored in honoring." (Figs. 26 and 27.)

From another paragraph he describes "a very delicate flat continuous or nonsectional expansion arch with parallel sides and rounded edges. It has therefore the form of a ribbon and in order to distinguish it from the other forms of my expansion arches I have called it the "ribbon" expansion arch. It is but twenty-two thousands of an inch (.022″) in thickness and thirty-six thousandths (.036″) in width. Its ends are also flat, but threaded, and are provided with my well-known friction sleeve."

Further excerpts follow as to the application of the ribbon arch. "The arch is then sprung with the fingers into the slots in the brackets, which it accurately fits, beginning with the one nearest to the first anchor band and proceeding in regular order until the anchor band on the opposite molar is reached, when the second nut is adjusted to approximately its proper position

on the arch, but neither the end of the arch nor the friction portion of the nut are at this time placed within the sheath of the anchor band. The arch is then disengaged from all the brackets, but not from the sheath of the first anchor band. Now the screw of the loose end of the arch is slipped into its sheath on the second anchor band, and the nut seated. Then, beginning as before, the arch is replaced in the brackets in exactly its former relations, the last step being the proper seating and accurate adjustment of the scond nut in its anchor sheath.''

Under the head of Possibility of Crown and Root Movement we read:—''To avoid confusion in discussing this mechanism, we have so far considered only the crown movements of teeth, but the distribution and control of force for root movement is equally feasible with it, either simultaneously with crown movement and in the same or in opposite directions, or independently of crown movement. The force from the elastic arch is distributed to the roots through

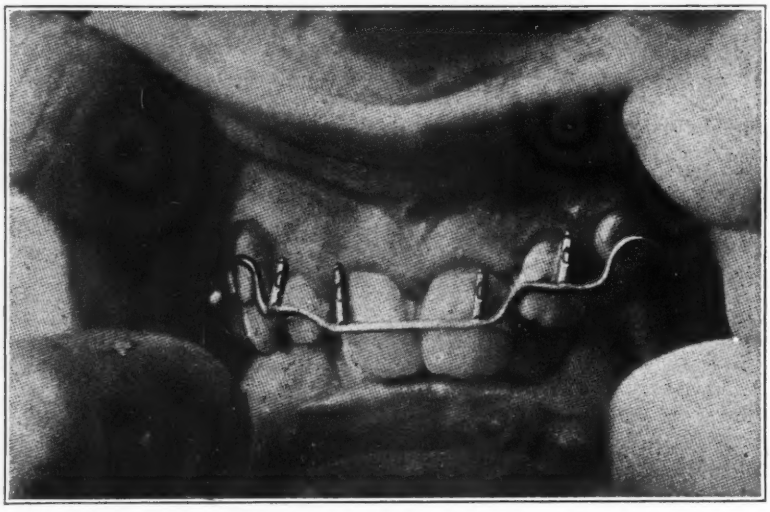

Fig. 28.—Angle's pin and tube appliance. (Ketcham.)

the vise-like grasp of the arch by the brackets. (The direction of force upon the root depends upon the angle of inclination given to the parallel sides of the metal arch, before it is sprung into the brackets.) If the crown and root movements are to be equal and in the same direction, as * * * * , where both are to be moved labially, or in * * * * * where both are to be moved lingually, the walls of the ribbon arch must be perpendicular before the arch is sprung into the bracket, so that the force will be distributed equally and in the same direction to both root and crown. If the labial movement of a root only is required, the ribbon arch is bent in the region of the bracket so that it will flare outwardly at the gingival border, and when sprung into position in the bracket will bind and exert force in a labial direction on the root of the tooth, * * * * * . By flaring it inwardly so that it will bind in the opposite direction when sprung into the bracket, the root of the tooth will be moved in a lingual direction, * * * * *. So it is easily possible to move either root or crown to any degree, according to the form given the ribbon arch and the angle at which it is inclined in its bracket relations. (Fig. 26.)

Note.—For further reading upon the ribbon arch see *Dental Cosmos,* V. lviii, No. 9—Angle.

ANGLE'S PIN TUBE APPLIANCE ARCH WIRE

Another form of arch wire as shown in the illustration of Ketcham, known as the pin tube appliance, antedates the advent of the ribbon arch, but in use has been largely supplanted by the more recent ribbon arch described above. Its purpose is the bodily movement of teeth. (Fig. 28.) This arch wire is one made entirely of precious metal; however, its use is limited at this time.

The labial arch wire then as a device for moving teeth has gone through a transition or migration from the original large, bulky, unsightly base metal wire of 16-gauge coming slowly downward to the more efficient delicate precious metal wires which may be fitted and adjusted to place to fit like a glove fits the hand and accordingly all play and looseness may be eliminated.

CASE REPORTS

CASE REPORT*

By Harry E. Kelsey, D.D.S., Baltimore, Maryland

MY excuse for showing this case is that it represents the result of treatment several years after all appliances, retaining and otherwise, had been removed.

Fig. 1. This is a Class II, Division 1, case with very crowded arches and a pronounced protrusion of the anterior teeth with the lower lip closing under the maxillary incisors.

Fig. 2. This represents the occlusal view.

Fig. 3 represents above, the case at the end of treatment, and below,

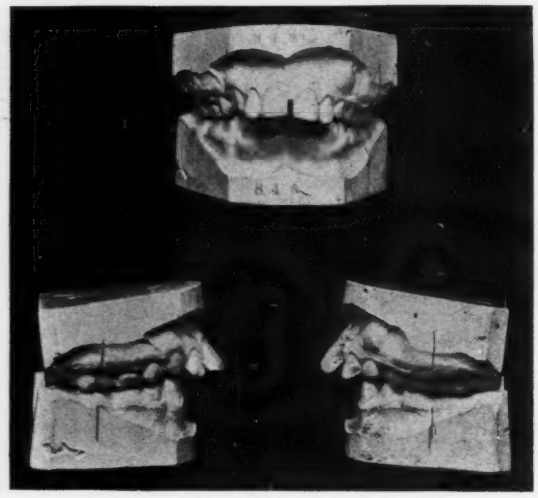

Fig. 1.

Fig. 2.

five years after that time. You will note three of the wisdom teeth have erupted.

Fig. 4 is a view of left side. At the left the case as it was when the retaining appliances were removed, and at the right as it was five years afterward.

Fig. 5 shows the right side of same casts.

Fig. 6. The front view of same casts.

Two other cases I will run through together. These boys were twins and looked so much alike that I could not distinguish them across the office.

*Read before the American Society of Orthodontists, at Chicago, Ill., April 24-25 and 26, 1922.

Fig. 3.

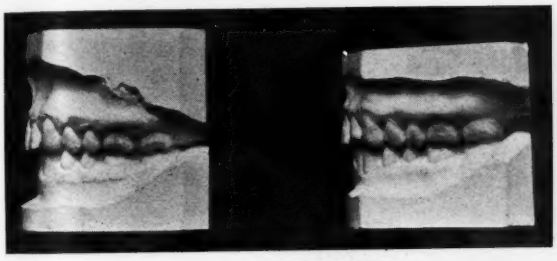

Fig. 4.

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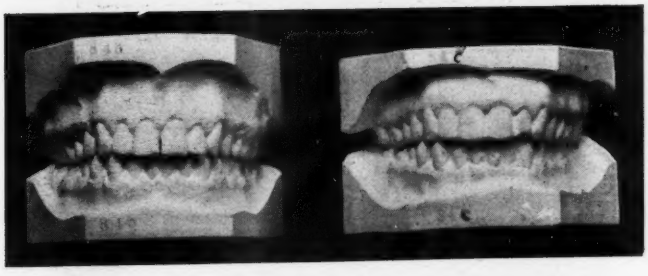

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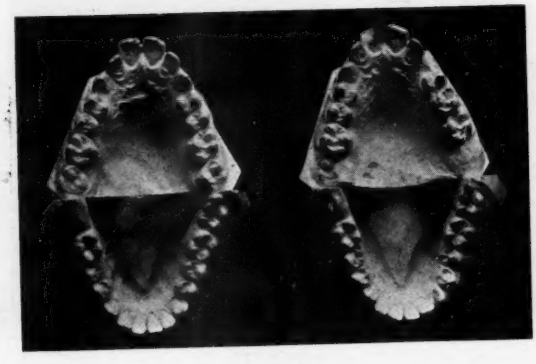


Fig. 7.

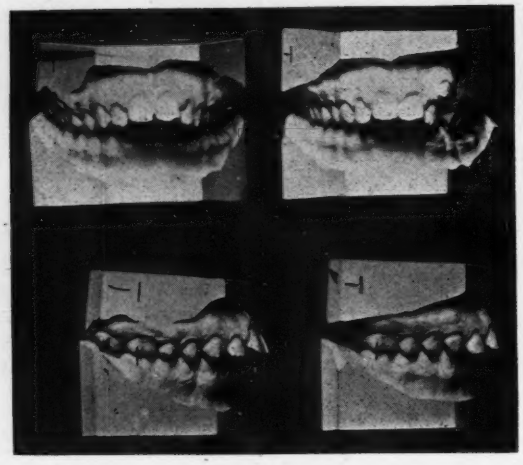
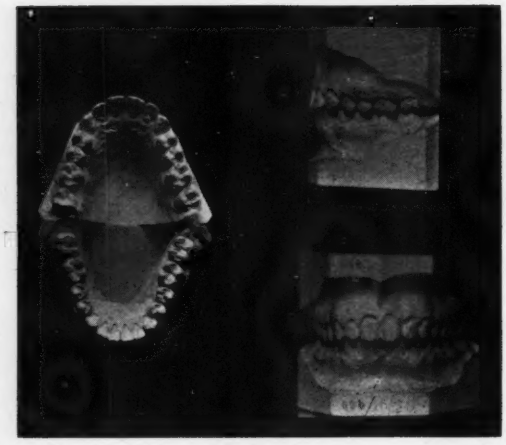


Fig. 8.



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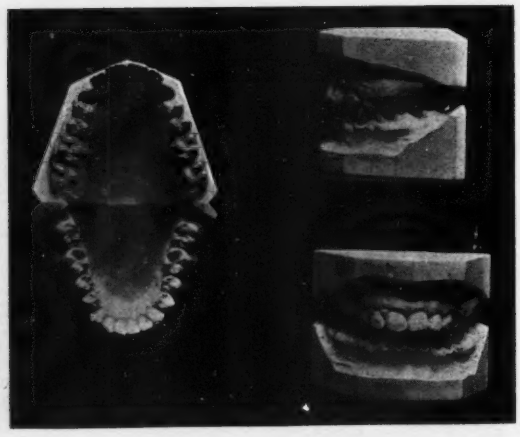

Fig. 10.

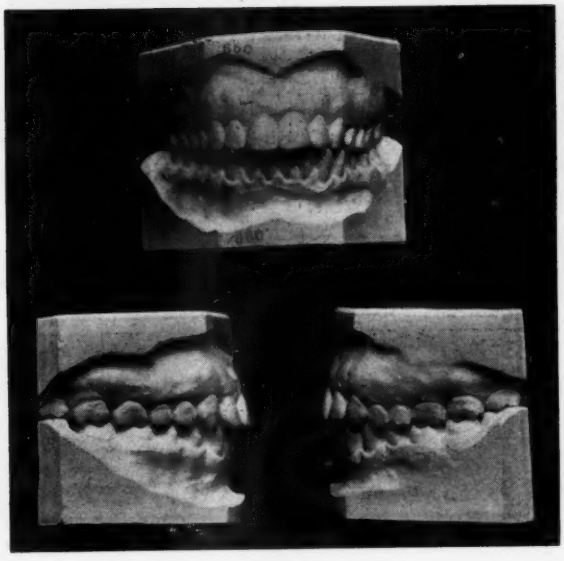

Fig. 11.

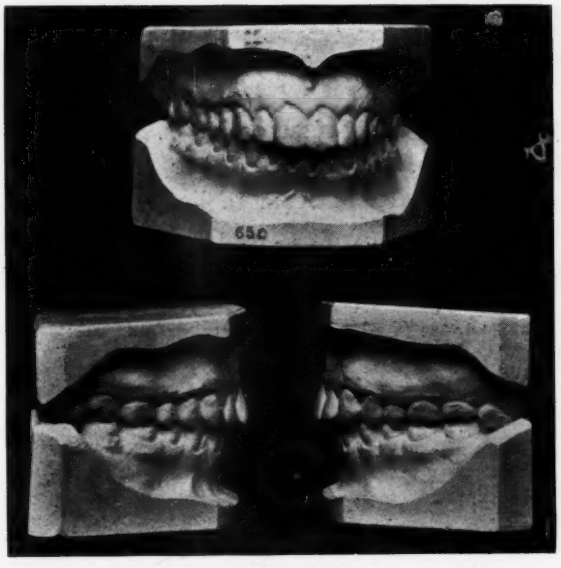

Fig. 12.

Fig. 13.

Their malocclusions were similar. Except for the retained deciduous canines you could hardly tell the casts apart.

Fig. 7 represents an occlusal view of these cases.

Fig. 8 is the front and side view of both cases.

Fig. 9 shows front side and occlusal view of one case soon after treatment and retention were completed and Fig. 10 is the other case after treatment and retention were completed.

Fig. 11 is one of the cases about six years after treatment and retention were discontinued and Fig. 12 is the other one at the same time. You can

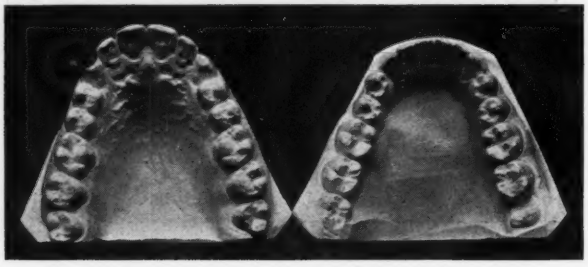

Fig. 14.

note that the mandibular third molars are not in position, and radiograms show them to be missing. Note also the elongated position of maxillary third molars.

Fig. 13. The occlusal view of same casts.

Fig. 14. The occlusal view of the other case.

The results of all these cases seem to be permanent, the shape and size of the arch as well as the position of the teeth being well retained after a lapse of five years or more since all retaining appliances were removed.

DEPARTMENT OF
ORAL SURGERY AND SURGICAL ORTHODONTIA

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STATUS OF UNERUPTED, IMPACTED AND MALPOSED TEETH

By James L. Zemsky, M.D., New York

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A GREAT deal has been written and much has been said about pulpless teeth. The importance which this subject has assumed in the practice of our profession fully justifies the space given to it in our journals and the time devoted to it at dental meetings.

At the present day we are sufficiently aware of the relations of the dental infection to the diseases elsewhere in the body, and in the practice of modern dentistry the attention of the practitioner is no longer entirely concentrated upon the "mechanical side" of it.

Having learned of the infective diseases of the body that come from the mouth, the members of the dental profession have done their part in educating the public, and many of the medical profession, concerning the nature of "bad teeth" and the *danger of neglect.*

Since the subject of "bad teeth" has been treated very exhaustively this discussion shall be confined to the teeth that are not "bad" *per se,* but which give rise to conditions that present possibilities of danger from neglect.

Unerupted, impacted and malposed teeth, while presenting abnormal conditions have been met with frequently enough in our practice to command more attention than they are given. So little consideration is given to the subject of the impacted and malposed teeth that quite often an operator finds himself in a very embarrassing position indeed, hesitating what to do—remove these teeth, or let them alone?

The unerupted, malposed and impacted teeth cannot be placed in one category with the normally erupted, *live* teeth, nor can they be classed with the *pulpless* teeth. They are, so to say, in "no man's land" and their status is not clear.

*Read before the Scientific Section of Oral Surgery, First District Dental Society of New York, April 18, 1923.

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A vital tooth presents to the operator comparatively little difficulty—*it must be conserved.* All operators agree on this and consequently this is the status of a vital tooth.

The pulpless tooth may be treated in several ways, namely: Surgically extracted, "just pulled out," treated, under certain conditions or conserved under *any* circumstances. This is all that an operator may do with a pulpless tooth and whatever will be done is at the present state of affairs, justifiable. Such is the status of a pulpless tooth.

But, what about the unerupted, impacted, or malposed teeth? May any two operators readily agree upon the procedure? Hardly so. In fact, the opposite is true. In cases where some operators will insist upon the removal of these abnormal teeth as soon as their presence is discovered, or advise the correction of the condition by means of surgical orthodontics—others will say: "Don't trouble trouble until trouble troubles you." As a result of such diversified opinions much embarrassment is caused to the operator and questionable benefit derived by the patient. This is, of course, a deplorable situation. The pulpless tooth problem is an exceedingly complex situation, but it is on our mind and a solution will be found without any doubt, but what hope is there for the unerupted, impacted and malposed tooth which is not given any attention? What is its status? Very indefinite, almost chaotic is the answer. May one be satisfied with such an answer,—obviously not—and searching for information throughout literature one's attention may be attracted by the following lines in Dr. Barker's article on "Oral Sepsis and Internal Medicine"—where he writes—"There are many diseases of the teeth other than septic infections that are related to internal medicine, but I shall not attempt to deal with them tonight. I shall confine my remarks to comments upon the general conditions that I have met with, or that others have met with, in association with infectious processes about the teeth and gums. Such infections are divisible into two groups: (1) gingivitis, pyorrhea alveolaris, and (2) *infections about unerupted and impacted teeth.*"

The above shows that unerupted, malposed, and impacted teeth may be looked upon as *foci of infections.* Whatever else may be found about these abnormal teeth, the fact that they are liable to be foci of infection is paramount, and places the unerupted, malposed, and impacted teeth in a definite important position, which is second only to the one occupied by the pulpless tooth.

Another important thing which ought to be borne in mind is the possibility of the unerupted, malposed and impacted teeth to act as peripheral irritants. These may bring about disturbances of nerve functions resulting in impairment of vision as well as cause a structural change in the nerve tissue, which results in producing various kinds of pains—such as earaches, headaches, and the different forms of neuralgia. When these conditions are permitted to exist for a sufficiently long period, the changes in the nerve structure become so marked that in many instances the removal of the impactions fail to give relief and much more extensive and serious surgical interferences must be resorted to. It is not infrequent that resection and evulsion of nerve or

even the resection of the entire ganglia do not give the suffering patient any relief.

Unerupted, malposed, and impacted teeth sometimes present a great and serious danger of neglect. Not giving rise to any symptoms these teeth will cause destruction of tissue through the process of necrosis and formation of cysts.

These conditions may be satisfactorily demonstrated by presenting to you a few typical cases which are virtually concrete proofs of the above contention.

Should this arouse a greater interest on the part of the members of this section to further investigation of this subject one may feel well satisfied that

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

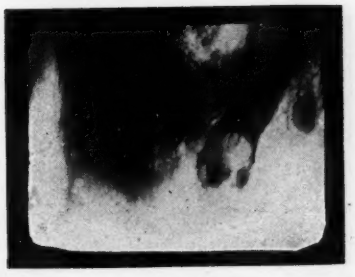

Fig. 5.

he had contributed a little towards an effort to bring the question of the unerupted, malposed, and impacted teeth into definite position and proper light.

The cases presented here are taken from the writer's practice and are reported for the sole purpose of giving information. The writer wishes to emphasize that it is not his intention to make inferences or claims of any kind regarding these cases, except saying that with the records of the marvelous results herein presented, he has also records of cases which showed only little improvement as well as of those that have resulted in complete failure.

All this seems to point to the fact that, since no definite data concerning the malposed teeth is available at the present time, the situation may be justly considered chaotic.

I desire to give credit to Dr. P. L. Lewin for making some of these radiograms.

Figs. 1, 2, 3, 4, and 5 present a series of radiograms of teeth unerupted, malposed or impacted, when these become infected through direct contact with infected teeth or when the areas of rarified bone spread so far that they reach the unerupted teeth. Radiograms in Figs. 1, 2 shows some caries in the unerupted canine. Radiograms in Figs. 3, 4, present a more progressive state of the destruction—coronal portion destroyed. Radiogram in Fig. 5, still more advanced stage of destruction involving part of the maxilla.

Fig. 6.

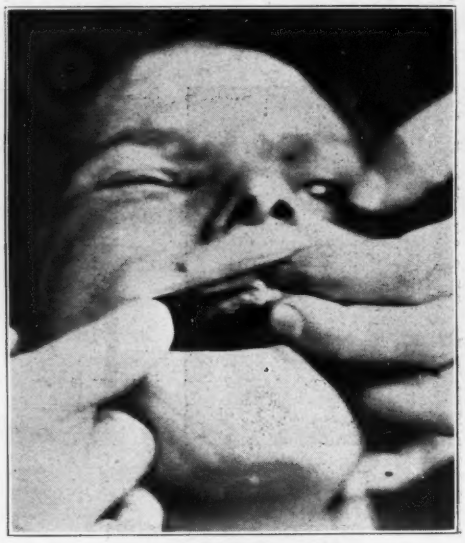

Fig. 7.

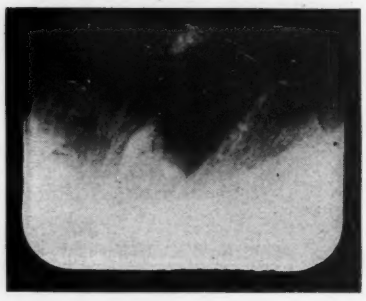

Fig. 8.

Fig. 9.

CASE No. 1. (Figs. 6, 7, and 8.) Mrs. N. R., fifty-five years of age. Referred to the office by an M.D. on March 3, 1923.

Complaint.—Pain on the right side of the face and very marked swelling (Fig. 6).

Clinical Picture.—Extensive swelling on the right side of face; eye partly closed; cheek ballooned out—Intraorally—jaw edentulous (Fig. 7). Inflammation present in the region of the right lateral, canine and premolar; tissues hypertrophied and puffed out; fluctuation buccally and palatally.

Radiogram.—Revealed an unerupted malposed canine with a carious crown and extensive area of rarified bone (Fig. 8).

Treatment.—Incision made under nitrous oxide and oxygen anesthesia; evacuation of pus and drainage.

Possible Etiology.—Infection which had emanated from the apex of a tooth which was in contact with the impaction or very close to it. An early discovery of the condition and a timely removal of the impaction may have prevented such condition.

CASE 2. (Fig. 9.)

Fig. 9 is a radiogram of an area of a superior right lateral, canine and premolar which reveals presence of a maxillary right canine, malposed and unerupted.

Patient.—Miss Pauline R., twenty-four years of age. Has been suffering for two weeks from facial paralysis—Bell's palsy on the right side of the face. The physician taking care of the case thought the teeth might be responsible for the condition. The patient went to the dentist who extracted a few badly broken-down teeth. No improvement followed and the patient very disappointed returned to the operator who referred the case to me. Having radiographed the mouth, a malposed tooth was discovered. Great care was taken to explain that removal of the malposed tooth was advisable but it was suggested merely because the condition was abnormal and not because the removal would effect a cure. The patient submitted herself for the operation which was followed by a perfect cure. Within one week's time, the patient was able to sleep with the right eye closed and within the following few weeks the face became normal much to the patient's delight and my great surprise.

Fig. 10.

Fig. 11.

CASE 3. (Figs. 10 and 11.)

Patient.—Miss M., 16 years of age. Student in a private high school. Came to the office in April, 1920.

Complaint.—Impaired vision which made reading difficult.

Radiogram.—Fig. 10 disclosed presence of an unerupted and malposed maxillary right canine. Writer advised the correction of the condition either through orthodontic treatments or by means of surgical removal. Parents decided to wait until after graduation from school. Towards the end of the summer the condition became so aggravated that the patient was brought from her vacation to the office to be operated upon for the removal of the malposed tooth in the hope that it might relieve the patient's failing vision. The writer, impressed the patient and her parents that the operation was advisable but might not improve the condition. He then proceeded with the removal of the impaction. Patient made an uneventful recovery and her vision was completely regained.

Fig. 11 shows the condition of the bone one year after the removal of the unerupted, malposed maxillary canine.

CASE 4. (Fig. 12.)

Patient.—Mrs. M., fifty-four years of age.

Complaint and History.—Patient had been suffering from headaches for many years, during which period she had received treatments of the frontal and maxillary sinuses, but

without any relief. Upon the advice of a dentist she had her teeth radiographed and the examination revealed the presence of an unerupted and malposed maxillary canine. Fig. 12. When the writer was asked for an opinion—an operation for the removal of the malposed tooth was suggested. No promise, however, was made to the patient that this operation would produce a cure. The much suffering patient has submitted herself for an operation from which she has made an uneventful recovery. Her many years of sufferings from severe headaches was followed by complete relief.

Fig. 13 shows a radiogram of the region of the maxillary centrals, laterals and right canine, which illustrates destruction of a root through absorption brought about by the pressure of an unerupted and impacted maxillary canine.

Fig. 12.

Fig. 13.

Fig. 14.

Fig. 15.

CASE 5. (Figs. 14 and 15.) Radiogram shown in Fig. 14, reveals the presence of an unerupted and malposed maxillary left canine. Radiogram shown in Fig. 15 reveals the presence of an unerupted and malposed molar in a horizontal position with its crown directed towards the tuberosity.

Patient.—Mrs. R., forty-one years of age, came to the office with the above radiograms, for the purpose of having these malposed teeth removed.

Complaint.—The patient came in limping and gave a history of having been suffering from rheumatic pain for some time. She had confidence that the removal of the malposed teeth would cure her.

As is my usual practice I explained to the patient, that while the removal of the malposed teeth was advisable, it did not mean that either cure or relief would follow. This did not affect the patient's enthusiasm regarding the outcome of the operation. After the removal of the canine the patient felt some improvement. The operation for

the removal of the molar was followed by a complete recovery. This was a very recent case and has not been followed up sufficiently long to make any definite conclusions.

CASE 6. (Fig. 16.)

Radiogram revealed presence of the maxillary third molar unerupted and impacted. Fig. 16.

Patient.—Mrs. Rosa L., forty-three years of age. Had been suffering from earache and impaired hearing. She was examined by a specialist who did not discover any ear

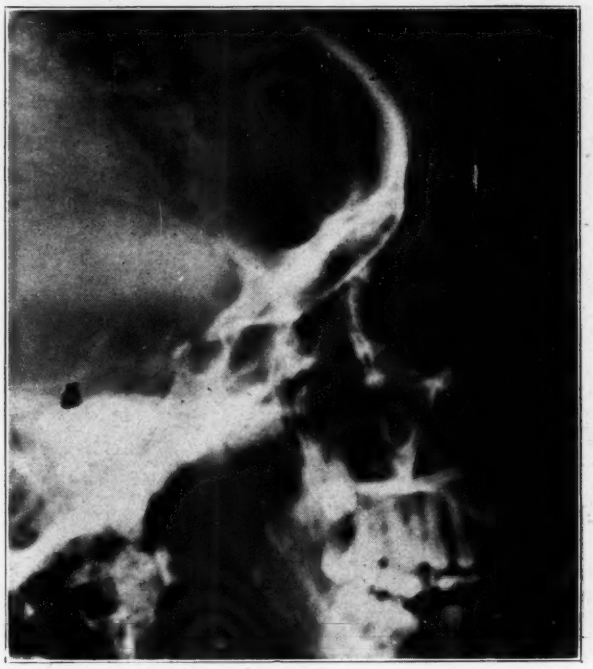

Fig. 16.

Fig. 17.

Fig. 18.

disease and suspected that the teeth were responsible for the patient's complaint. The tooth has been removed recently but the result is not known as the patient has not returned to the office since the operation.

CASE 7. (Figs. 17, 18, and 19.)

Patient.—Miss J., twenty years old. Senior Student. N. Y. Training School for teachers. Came to the office on March 17, being referred by a dentist.

Complaint.—Trismus, with a very marked endurated swelling, extending from the angle of the jaw on the right side to the symphysis. Fig. 17. Intraoral examination showed partly erupted malposed third molar on the right side. She had had some discomfort from the same tooth but was advised to wait and see "How it will work out."

Radiogram.—Disclosed a partly erupted third molar with an area of rarefaction posterior to the crown of the tooth. Fig. 19.

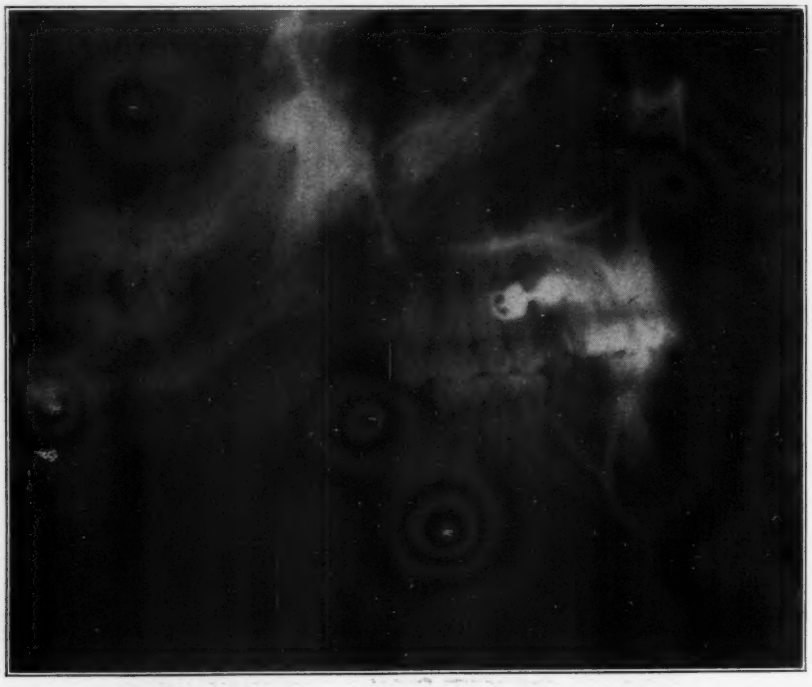

Fig. 19.

Diagnosis.—Lymphadenitis.

Treatment.—A free incision in the region of retramolar area—removal of this tooth and drainage. On the third day fluctuation was felt and an extraoral incision had to be made. A timely removal of the malposed tooth would have prevented all the trouble, and the scar resulting from the operation avoided. Fig. 18.

DEPARTMENT OF
DENTAL AND ORAL RADIOGRAPHY

Edited By
Clarence O. Simpson, M.D., D.D.S., and Howard R. Raper, D.D.S.

POSITION OF THE HEAD FOR INTRAORAL RADIODONTIC WORK*

By Howard R. Raper, D.D.S., Indianapolis and Albuquerque

I. INTRODUCTORY

THIS is the third of a trilogy of papers on radiodontic technic.

The first was devoted to a consideration of "Positioning the X-ray Tube," that is to say, to measuring the x-ray angle by means of an *angle meter.*

The second dealt with "Placing and Holding the Film in the Mouth."

This, the third and last paper of the series, is as its title indicates, a discourse on the "Position of the Head."

More than 99 per cent of operators use the sitting posture for intraoral radiographic work; the remainder use the recumbent position. What follows is written with the sitting posture in mind, though what is said applies to the recumbent posture too with this provision: that the vertical of the recumbent position is the same as the horizontal of the sitting posture.

II. DIFFERENT SUGGESTIONS

For years radiodontic operators were satisfied to say of the position of the head simply that "the head should be erect" or that "the crown of the head should be straight up."

Then this writer suggested that "the head should be in such position that the roots of the teeth, being radiographed, would be substantially vertical."

Then Simpson made an excellent suggestion: Namely, that the plane of the occlusal surfaces of the teeth be used as the basis for determining head position. He suggested that the occlusal plane, or to be more exact the occluso-incisal plane from the distal of the first molar forward, should be horizontal.

Someone else, I am not sure who, perhaps Van Woert, suggested drawing a line from the *tragus* of the ear to the *ala* of the nose (Fig. 1) and

having the head in such position as to make this line parallel to the floor plane, i.e., horizontal.

Creszyinski suggested drawing a line from the ala to the *lower border of the orbit,* and horizontalizing this line for the upper teeth, and another line from the *ala* to the *corner of the mouth* and horizontalizing this line for the lower teeth.

Fig. 1.—The line drawn from the *tragus* of the ear to the *ala* of the nose represents in a moderately accurate manner the occlusal plane of the teeth.

Fig. 2.—Simpson *occlusal plane finder* with double (two-way) spirit level.

III. THE OCCLUSAL PLANE FINDER AND THE EFFECT ON OCCLUSAL PLANE OF OPENING MOUTH

Of all of these suggestions, Simpson's seems, to me, to be the best. One thing in particular that contributes to the soundness of Simpson's suggestion is that he has introduced a device for measuring (so to speak) the position of the head. He calls this device an *"occlusal plane finder."* It

consists simply of a flat surface and a round or double spirit level. (Figs. 2, 3 and 4.)

With the teeth closed, the occlusal planes of both upper and lower teeth are substantially the same (Fig. 5). (For convenience I shall hereinafter refer to "the occluso-incisal plane from the distal of the first molar forward" as the "occlusal plane.")

If the mouth is opened, without moving the head, the occlusal plane of the lower teeth is changed, but the occlusal plane of the upper teeth is not. (Fig. 6.)

The wider the mouth is opened the farther the plane of the lower teeth departs from the plane of the upper teeth.

The Simpson occlusal plane finder, is an excellent thing as a teaching device, to show what is meant by, "have the occlusal plane horizontal."

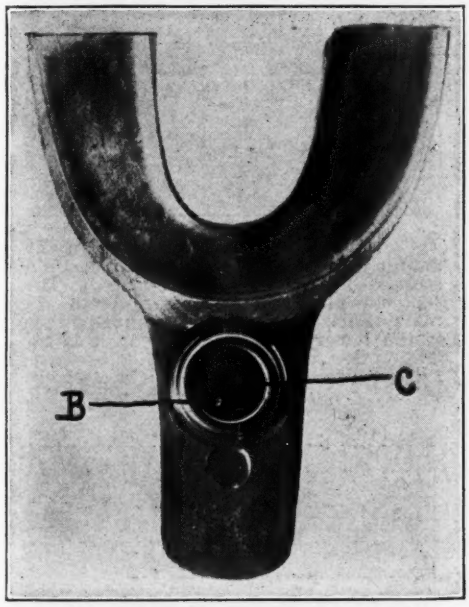

Fig. 3.—Simpson's occlusal plane finder, with circular spirit level. *C*, center of the level. *B*, bubble in the spirit level. It is best to have that part of the finder which carries the spirit level detachable from the rest, so it may be detached while the other part of the finder is sterilized by boiling.

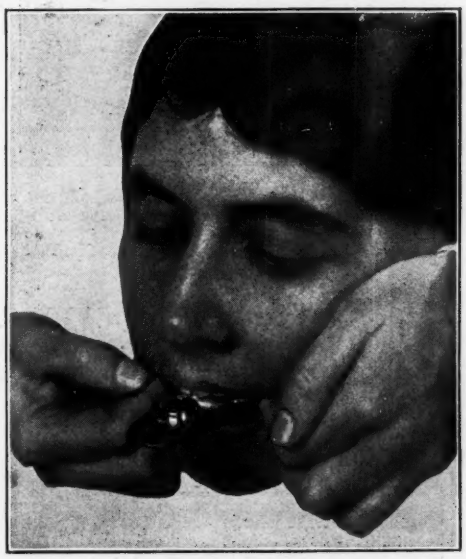

Fig. 4.—With the flat surface or plane of the finder held against the occlusal plane of the teeth the head is moved to make the bubble (*B*, Fig. 3) of the spirit level register center.

But as a device for practical use it has the fatal shortcoming of being of such nature that it cannot be used just when it is needed. That is to say, the radiodontic operator wants to know if the head is in the right position, just before he makes the exposure and while the film packet is in the mouth. And the finder cannot be used while the film is in the mouth! (Except when the film is placed flat in the mouth; that is, simply laid flat on the biting surfaces of the teeth and held by having the patient "close.")

IV. THE HEAD LEVELER

In an effort to overcome this shortcoming, and so make the finder something more than a teaching device, the writer tried using the *head leveler*

illustrated in Fig. 8. The occlusal plane of either upper or lower teeth was found, by means of the Simpson occlusal plane finder, then the circular spirit level on the head leveler set to register level. The finder could now be laid aside, and the head position duplicated, after movement, by means of the spirit level in the head leveler.

To be perfectly frank I did not expect this device to be a practical success—and it wasn't. But while experimenting with it, an important fact,

Fig. 5.—The occlusal planes of the teeth (both upper and lower) are substantially horizontal.

Fig. 6.—Same as Fig. 5, but with the mouth opened. The head has not been moved—just the mouth opened. The occlusal plane of the upper teeth remains horizontal, but the occlusal plane of the lower teeth is changed; it is no longer horizontal. To make it horizontal, the head must be tipped backwards. (See Fig. 7.)

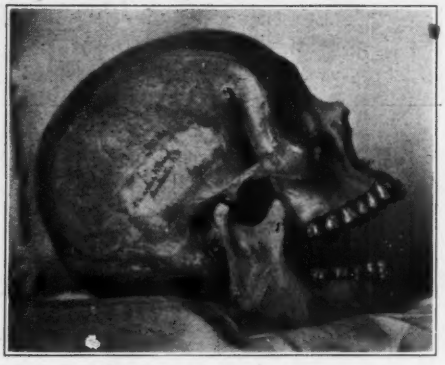

Fig. 7.—Mouth open, the same as in Fig. 6, but now the head is tipped back until the occlusal plane of the lower teeth is horizontal.

Fig. 8.—Head leveler, used in connection with the Simpson occlusal plane finder. Not practical.

which perhaps I should have noted before but did not, became clear to me: *Patients seldom tip the head to an incorrect position sideways.*

Trouble from incorrect head position, in radiodontic work, is substantially always due to the fact that the head is either tipped too far, or not far enough, back.

The operator may determine head position by looking at the teeth themselves, seeing to it that the occlusal plane is horizontal. If, however, he wishes to use some facial, some extraoral indicator of some sort, he does not

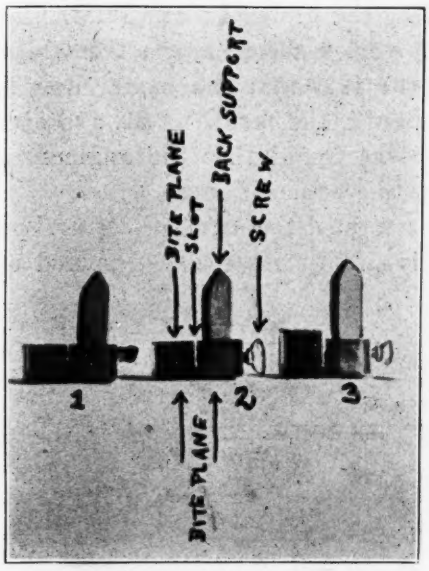

Fig. 9.—Set of universal film holders.

Fig. 10.—Showing the occlusal plane horizontalized by means of the Simpson *occlusal plane finder* and the *external occlusal plane indicator* stuck on the temple.

Fig. 11.—Correct position of the head for radiographing the upper teeth. Note that the upper line of the indicator is horizontal. The film packet is in place for the upper anterior teeth and is held with a film holder.

Fig. 12.—Correct position of the head for radiographing the lower teeth. Note that the lower line of the indicator is horizontal. The film packet is in place for the lower anterior teeth and is held with a film holder.

need a device to measure lateral tipping. All he needs is something to enable him to see that the head is not tipped too far back or forward.

So the head leveler was discarded and horizontal lines drawn on the face, at the temple, (with a wax pencil or lip stick) after using the finder to determine the occlusal plane. With the lines drawn, the finder could be

laid aside and the head put in the correct position by horizontalizing the lines on the temple.

V. THE EXTERNAL OCCLUSAL PLANE INDICATOR

The angle at which the line, representing the occlusal plane for the lower teeth, leaves the line for the upper teeth, varies according to the width to which the mouth is opened. In view of the fact that the writer uses film-holders (Fig. 9) to hold the films in the mouth, the mouth is always opened to substantially the same width. Thus it was found that the angle formed by the two lines was always substantially the same.

This led to the making of what may be termed the *external occlusal plane indicator.* (See Fig. 10.) The indicator is simply a piece of gummed cloth (or paper) with the two lines on it.

Fig. 13.—The upper line of the occlusal plane indicator indicates the occlusal plane of the upper teeth. The lower line of the indicator indicates the occlusal plane of the lower teeth. Lines drawn to certain facial landmarks practically parallel these lines: A line from the *tragus* of the ear to the *ala* parallels the upper line, a line from the tragus to the *corner* of the *mouth* parallels the lower line.

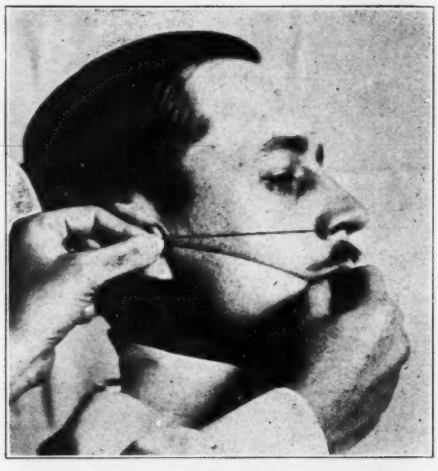

Fig. 14.—The upper line has been put on; the operator is in the act of placing (printing) the lower line with a piece of string covered with lip stick.

The operator may have rubber stamps made (one for each side) to print the lines on gummed paper or Dennison's "mending tape."

VI. USING THE OCCLUSAL PLANE FINDER AND INDICATOR

Procedure.—The Simpson occlusal plane finder is placed in the mouth as far back as the first molar (inclusive). The patient holds it by biting. The head is moved until the spirit level registers center. So, the occlusal plane of the upper teeth (and the lowers while the mouth is shut) has been "found." Now moisten the external occlusal plane indicator with a drop or two of water and apply it to the temple with the "upper" line horizontal. The finder may now be laid aside. Have the upper line parallel with the floor—i.e., horizontal—for the upper teeth (Fig. 11) and the lower line horizontal for the lower teeth. (Fig. 12.)

It will be seen that if we are to use the indicator the width to which the mouth is to be opened when radiographing the lower teeth must be standardized. The operator may make it a point to see to it that the mouth is always opened to about the same width or, which is much better, film-holders may be used as I have already suggested. The careful observer will note that the bite block for holder No. 3 (Fig. 9) is thicker than Nos. 1 and 2 and would therefore hold the mouth open wider. But, ordinarily, this

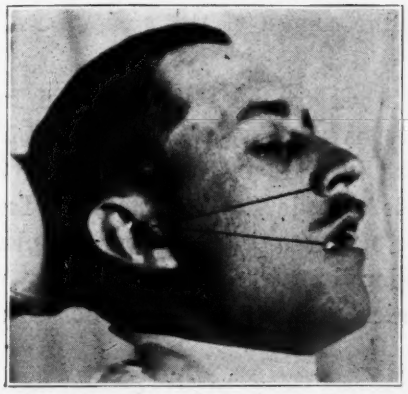

Fig. 15.—This is the position the patient ordinarily assumes when the film packet is placed in the mouth for an upper tooth. *Incorrect.* The head is tipped back too far.

Fig. 16.—*Correct* position of the head for the upper teeth. The film packet is placed for the upper anterior teeth. It is held in place by means of a film holder, on which the patient bites.

Fig. 17.—This is the position the patient ordinarily assumes when the film packet is placed in the mouth for a lower tooth. *Incorrect.* The head is not tipped back far enough.

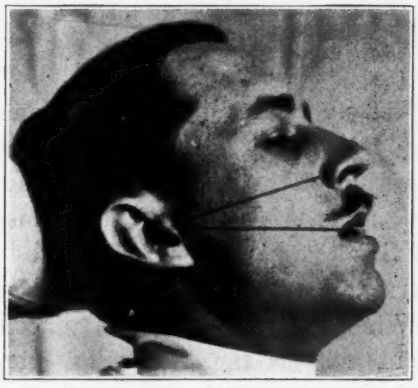

Fig. 18.—*Correct* position of the head for the lower teeth. The film packet is placed for the lower anterior teeth. It is held in place by means of a film holder, on which the patient bites. (Figs. 9, 14, 15, 16, 17 and 18 are reprinted here from the book "Radiodontia" by courtesy of the Dental Items of Interest Publishing Co.)

holder is used in the anterior part of the mouth; and it takes a wider block in the anterior part of the mouth to hold the mouth open to the same width it would be held by a smaller one farther back in the mouth. It must be admitted that the holders do not always hold the mouth open to *exactly* the

same width, but the variation is slight, nothing like the variation which might occur when the patient holds the film with the thumb or fingers.

VII. FACIAL LANDMARK LINES

The next thing I want to direct my reader's attention to is that certain facial lines, previously mentioned, practically parallel the lines of the External Occlusal Plane Indicator as the indicator appears on the temple, after using the finder to "find" the occlusal plane. (See Fig. 13.)

A line from the *tragus* (of the ear) to the *ala* (of the nose) parallels the upper line, while a line from the *tragus* to the *corner* of the *mouth* parallels the lower line on the indicator.

So if the operator wishes to, he may work to these lines drawn from facial landmarks, instead of using the external occlusal plane indicator.

Simpson "doubts" if the relationship between facial landmarks and the occlusal plane remains the same in all people. So do I. Doubtless the facial landmark lines are not as accurate a means of indicating the occlusal planes as the indicator in connection with the finder, but I rather think they will be found accurate enough to serve as a clinical guide for those who wish to use them.

The facial landmark lines may be imagined or actually drawn on the face, as the operator may wish. If the lines are to be drawn on the face, cover a piece of string with lip stick or carbon, then apply the string firmly to the face, as illustrated in Fig. 14.

(The manner in which women dress their hair rather complicates things for the operator who wishes to use the ear for a landmark to determine head position.)

VIII. PRACTICAL CLINICAL CONSIDERATION

Let us pause just for a moment to consider what trouble occurs, in radiodontic work, due to incorrect position of the head. The answer is: elongation of the radiographic images of the upper anterior teeth and failure to get the root ends, and sometimes elongation, of the lower anterior teeth. And this trouble is caused by the head being tipped too far back for the uppers and not far enough back for the lowers.

When the filmpacket is placed in the mouth for the upper teeth the patient will, as the filmpacket encroaches on the tissues, almost invariably shrink away from the film, and so tip the head back too far. (See Fig. 15.)

The operator must see to it that the head is tipped back down, as in Fig. 16. Say to the patient "put your chin down" at the same time assisting the patient with the hands, Fig. 16.

It may sometimes be expedient to say something like this to the patient: "Don't you try to move your head at all. Let me move it for you. Don't try to help me." The operator may then place a hand on each side of the head and face and firmly put the head where he wants it to go.

When the filmpacket is placed in the mouth for the lower teeth, the patient will, as the filmpacket encroaches on the tissues, almost invariably shrink away from the film, and so tip the head down too far. (See Fig. 17.)

The operator must see to it that this position is corrected, that the head is tipped back up, as in Fig. 18. Have the patient "raise the chin," "tip the head back."

It is odd, and somehow the perversity of it rather amuses me: that the tendency of the patient is to involuntarily assume the correct position for the *lower teeth* when the operator is radiographing the *upper teeth*, and conversely (and still perversely) assume the correct position for the *upper teeth* when the operator is radiographing *lowers*.

IX. LET'S ALL AGREE WITH SIMPSON

It will be noticed by the observant that the different workers have no great difference of opinion as to what constitutes the correct position of the head.

It is pretty much a case of all trying to say the same thing and all working independently and saying the thing differently.

The suggestion to have the head "straight up" is all right, as far as it goes; but it is not specific enough.

The suggestion to horizontalize a line from the *tragus* to the *ala* is good for the upper teeth, but is inadequate for the lower teeth.

The suggestion to have the long axis of the teeth substantially vertical is sound, I believe, but Simpson expresses essentially the same idea *better* when he says to have the occlusal plane horizontal.

The idea of horizontalizing the occlusal plane is better than verticalizing the teeth for at least two reasons: (1) the occlusal plane can be "found" by means of the occlusal plane finder and (2) the occlusal plane can be indicated on the face by lines; either facial landmark lines or External Occlusal Plane Indicator lines.

I suggest that the best way for all to come to an agreement, and to commence to get some order out of the chaotic teaching about head position is *first to accept Simpson's suggestion and make the occluso-incisal plane, from the distal of the first molar forward, the basis for standardizing the position of the head.*

Thus facial landmark lines may be used, but they should be looked upon as representing the occlusal plane (in a moderately accurate manner). The head should be "straight up" and the "roots of the teeth vertical," but these things should be accomplished by thinking, not of them specifically, but in terms of horizontalizing the occlusal plane.

X. IN CONCLUSION A TERSE SUMMARY

"But what am I to *do?*" asks the operator who may have been very patient and read clear to this point.

Let me answer first by saying: Decide your head position by the occlusal plane. Do this (1) by looking at the teeth (2) by using the occlusal plane finder and external occlusal plane indicator or (3) by means of facial landmark lines (which represent the occlusal planes) imagined or actually drawn on the face.

A Philosopher's Reply to Criticism

BONWILL said: "Hail the man who has never made a mistake, for he has done nothing."

George Ade said: "Who is knocking you now? The live one is always a target. Only the dead stay on their pedestals."

When a man "breaks into print," he must expect criticism. If he is not willing to accept constructive criticism cheerfully, or unfair criticism as a "real sport" should do, then he had better not write for the Journals.

As for myself, I am grateful for *all kinds* of criticisms, and I will tell you just "for why."

To illustrate: A few years ago I wrote a little article, and, as a result, received over thirty very complimentary letters. That was very nice indeed, but I did not learn a single thing from the whole bunch taken together. And then I received one "scorcher" from some one who did not have the nerve to sign his name Now, as a matter of fact, his criticism was not wholly *just,* and it did not worry me in the least, but it gave me a lot to think about, and it taught me a lesson all the same, and I have profited by it too. My only regret was that he did not sign his name, that I might have written and thanked him for his letter.

No "live one," whether he be editor or contributor, need expect to escape criticism, and the more fair criticism he gets, the better it is for him; it will help him along.

Quite recently, I came in again for a rather severe criticism, and while it was not considered exactly a fair one, still it brought home a lesson to me, which I trust I will take to heart.

Amongst other things, it was said of me that "I had written upon all subjects under the sun," or words to that effect. I really had not appreciated that fact before, but upon considering this charge, I realized that I have written upon many topics, but invariably when I wrote of methods of operating, I always confined myself to descriptions of *work that I was actually doing,* and I never yet have strayed off into imaginary fields and given fanciful instructions as to how to perform operations that *I,* myself, did not perform. So there is some consolation in that fact at any rate.

David Harem said: "A reasonable amount of fleas is good for a dog—they keep him f'm broodin' on bein' a dog."

Therefore, I would again say that criticism is necessary for the well being of editor and writer alike. It keeps them from—to use a slang expression—getting "stuck on themselves"; therefore, they should be "good sports" and take it all good-naturedly, and never lose their tempers over it.

—C. Edmund Kells.

THE TECHNIC OF ORAL RADIOGRAPHY

By Dr. Clarence O. Simpson, St. Louis, Mo.

REGIONS IN DETAIL (Continued)

Maxillary Canine Region

(*Continued from page* 476)

Position of Head. Occlusal plane of maxillary teeth horizontal.

Vertico-horizontal Angle of Projection. Average 40 degrees.

Modifications. Forty-two degrees or greater where there is a marked labial inclination of the canine tooth, or the root is exceptionally long. Thirty-eight degrees or less as the canine tooth approaches a vertical position, or where the root is abnormally short.

Mesio-distal Angle of Projection. Perpendicular to the labial ridge of the canine tooth.

Modifications. Slightly mesially or distally if the canine is rotated, when there is a marked mesial inclination of the teeth, or to disclose both roots of the first premolar.

Placement of Film Packet. Longer dimension vertically. Upper mesial corner bent. Place mesial side to include the root of the lateral incisor, which will include the crown except where there is a marked inclination of the tooth. Place incisal end to include the cusps of the teeth in symmetrical relation to the end of the packet at the predetermined angle of projection, which requires the distal corner to be lower than the mesial to compensate for the greater bucco-lingual diameter of the premolars.

Retention of Packet. Thumb of patient's opposite hand placed nearer the upper mesial corner to closely adapt the packet and minimize the area of distortion.

Spark Gap. 4 to 4½ inches.

Exposure. 90 to 120 milliampere seconds at an 18 inch target-film distance.

Explanatory Description. One view is allotted to the maxillary canine, because the length of the root and the curve of the arch at that point prevents including it in a normal view of the incisors or premolars. However, in the examination of the canine region, a diagonal view of the lateral incisor and premolars may be obtained to disclose additional information on the incisor region, and the separate roots or canals of the first premolar.

The maxillary canine region presents little technical or anatomic difficulty excepting the calculation required to record the approximate length of the root without an excessively large area of distortion in the negative. The apex of the root is usually so near the level of the vault that there is slight

latitude in the vertico-horizontal angle of projection which will produce foreshortening or distorted elongation. In calculating the mesio-distal angle to record the roots of the first premolar separately, the position of the tooth

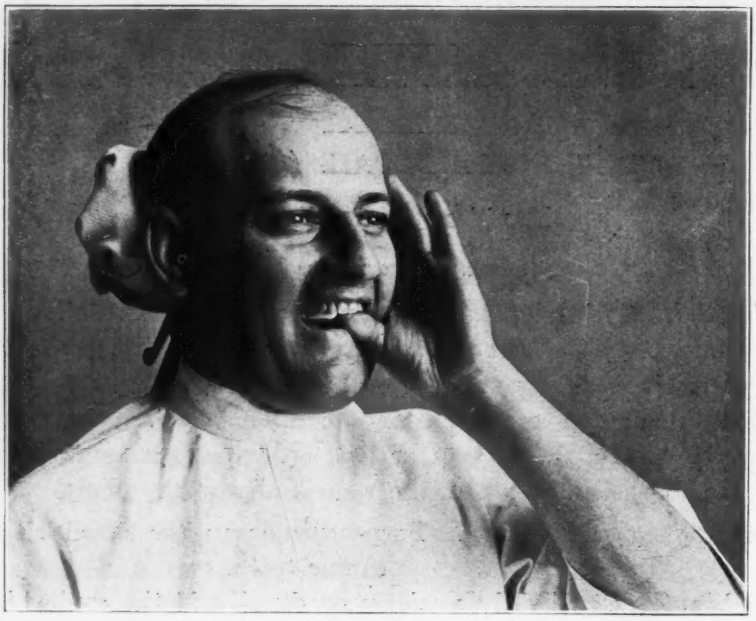

Fig. 1.—Position of the film packet and retaining hand for the maxillary canine region. The contraction of the muscles to expose the teeth has produced a heavy fold of tissue above the angle of the mouth.

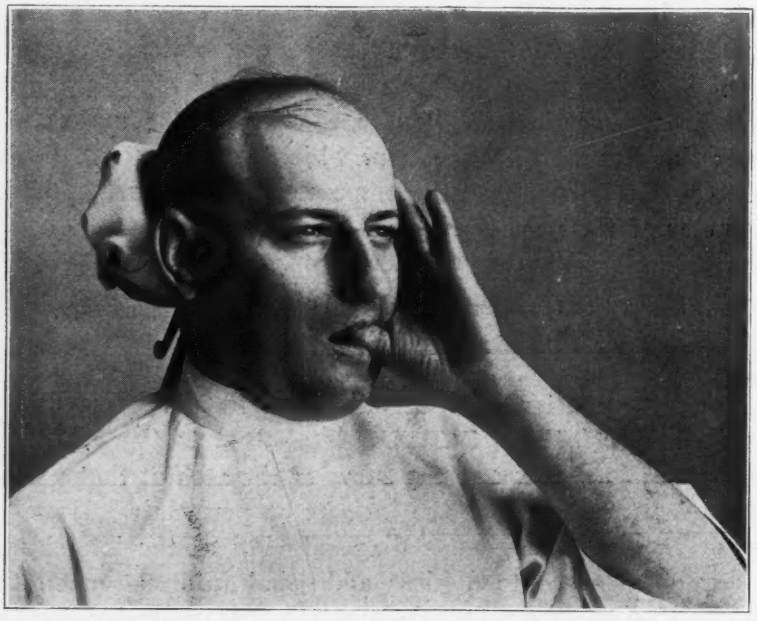

Fig. 2.—Levator muscles relaxed permitting the lip to cover the teeth, and eliminating the fold of tissue shown in Fig. 1.

should be studied from the occlusal and buccal surfaces. When the premolar is rotated, the mesio-distal angle should be modified to approach a perpendic-

Fig. 3.—Position of patient and cone for exposure of the maxillary canine region.

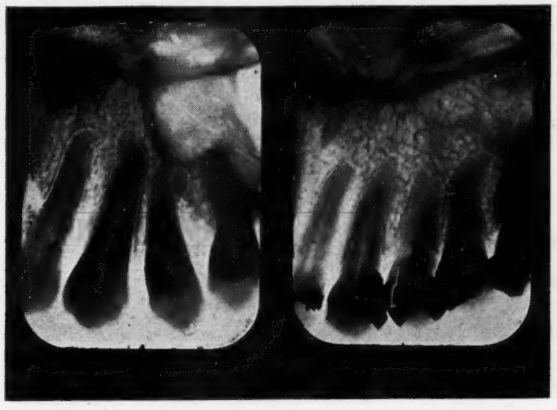

Fig. 4.—Typical views of the maxillary canine region, disclosing the lateral incisor and the roots of the first premolar separately. In the right illustration, the crown of the lateral incisor is only partially included to avoid excessive distortion in the upper mesial corner.

Fig. 5.—An illustration of the difference in distortion and root length in the image by a change of only 5 degrees in the verticohorizontal angle of projection.

Fig. 6.—An illustration of the line of demarcation produced by contraction of the levator muscles, and the improvement from eliminating the confusing shadow. The incisor portion of this region is more radiolucent than the remainder of the alveolar process without exaggerating the contrast.

Fig. 7.—A perforation between the roots of a first premolar, which is disclosed by the diagonal view. The roots of the first premolar are usually superimposed when viewed with the first molar.

Fig. 8.—A case in which the divergence of the lateral incisor and canine roots prevent showing them to the best advantage in the same view.

ular to a line midway between the buccal ridge and the mesio-buccal angle. When the buccal surface is rotated toward the mesial, it is often possible to disclose the roots separately in the view of the premolars with the first molar region.

Before the exposure, the patient should be requested to relax the lip to cover the teeth to equalize the soft tissue resistance to the rays. While examining the teeth and placing the packet in the canine region, there is a tendency for the patient to lift the lip and angle of the mouth by a vigorous contraction of the levator muscles. This produces a fold of tissue one-half an inch or more in thickness extending upward and forward from the angle, with a resultant diagonal line of demarcation in the negative. Since the incisor portion of this region is more radiolucent than the premolar, when the contrast is exaggerated by muscle contraction it may cause an incorrect diagnosis of pathologic destruction in the incisor area or fracture of the canine root. To eliminate the objectionable shadow it is often necessary to request the patient to contract the lips as though to whistle, and when adipose deposits are heavy or the muscles and lines of expression are strongly developed, the difficulty cannot entirely be overcome.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

An Important Advance in Dentistry. Editorial in Oral Health, March, 1923, xiii, 3.

The editor refers to the announcement by Dr. H. K. Box of Toronto that he had succeeded in reattaching the soft tissues to the cementum after the clinical treatment of periodontal pus pockets. This *per se* is not new but former claims to this effect have not been supported by histological evidence. In true pyorrhea there is always a pocket at the neck of the tooth which has been preceded by rarefaction of the alveolar process. In false pyorrhea the rarefaction is not a primary but a secondary condition, due to the presence of a pocket secondary to simple gingivitis. The latter affection closely simulates true pyorrhea. Finally there may be a pus-pocket from chronic gingivitis in which the alveolar process remains intact. In treating the conditions the first indication is to destroy the pocket, and then if the alveolar process has become rarefied to recalcify it. Despite theoretic objections it has been established that the cementum can become attached to the soft tissues and the matrix of the bone recalcified; these results are due wholly to the skillful treatment applied.

As soon as the proper illustrations have been prepared Dr. Box's paper will appear in *Oral Health* with the author's methods of management of these cases.

Mouth Hygiene. B. W. Neave (Sydney). The Dental Science Journal of Australia, January 1, 1923, iii, 1.

Under this head the author mentions the efforts of Wallace, Pickerill and others to reestablish a natural hygiene of the teeth by restoring the functions of mastication and salivation. In regard to the prevalence of caries today it must not be forgotten that thousands of children who could not have thrived a few years ago now grow up, thanks to the movements for infant conservation and prevention and more rational treatment of children's plagues. Many of these weaklings, although spared, may exhibit structural defects, for example, in the enamel. Under the head of diet much is said

today of choice of foods from the mere adhesive side; since those pulpy substances which adhere obstinately to the teeth antagonize a clean mouth. Sweets are also notorious offenders in this respect. Fruit at the end of the meal seems in individual cases to prevent caries through cleansing the teeth of the pulpy and sweet foods of the meal, but very acid fruit is inclined to overneutralize the saliva and not much of this should be taken at a time. Mechanical cleansing of the teeth or cleanliness in the narrower sense comes last in prophylaxis. In discussing the paper Charlton spoke of the correlation between nationality and food. The Briton likes sticky porridges, puddings and soft bread, while the Chinese eats the naturally sticky rice. In the latter race wide arches are the rule and the teeth being regular offset the lodgment of food in the interstices, while among the British there are many cases of narrow arches and badly aligned teeth. In regard to the cleansing effects of fruit he has his doubts, for if one inspects the mouths of children in fruit growing areas he finds much caries, the teeth being also filled with fruit debris. In these cases the Pickerill theory does not work out.

Nonvital Teeth and Their Relation to Focal Infection. T. C. Bonney (Aberdeen, S. D.). The Journal-Lancet, Feb. 1, 1923, xliii, 3.

The doctrine of focal infection as a major cause of disease has done untold harm along with good. This can be traced to misapprehension of facts. There is an important distinction between dead and nonvital teeth. In the first the pulp is either dead or has been removed and the peridental membrane no longer functions. In the second, although there is no pulp the peridental membrane is intact, so that although devitalized, the tooth is not yet a foreign body and may be retained in the mouth without prejudice. There is still another type of tooth which retains its pulp but has sustained extensive damage to the peridental membrane. This type may be a distinct menace to health if the loss of membrane is due to suppuration. The condition is of course no other than pyorrhea alveolaris, and it is often possible to save these teeth by saving the integrity of the peridental membrane. It is the destruction of the latter that makes possible the formation of the pyorrhea pocket. The membrane cannot be regenerated, hence we can only endeavor to save enough of it for the discharge of its functions. Mere scaling and the use of drugs cannot in the author's experience effect a cure unless the membrane can be salvaged. Pyorrhea teeth are often retained for years without apparent impairment of the general health, but the pocket is bound to increase in size and may at any moment become infected. With constant care taken to prevent infection, however, the condition may become stationary and infection may be warded off, although in theory the condition of the patient is precarious, just as in the case of a man with gallstones or infected tonsils. By watching such teeth it is possible to decide when they must be extracted.

In pulpless teeth with membrane intact the problem is less simple. In the practice of many dentists too much stress is laid on the condition of the

root canals but the author regards this as unessential. Whether the canals are completely or incompletely filled is of little moment compared with the state of the peridental membrane. To extract teeth because of imperfect or incomplete root-canal filling alone is meddlesome dentistry. With perfectly filled roots there may be periapical infection while the latter may be absent even if the roots are not filled at all.

In the same manner too much reliance on x-ray shadows is to be discouraged. This valuable resource has been in part vitiated first by unskilled radiography and second by misinterpretation of shadows. Both radiographic technic and interpretation should be left to qualified experts who are instructed in distinguishing shadows due to infection from those due to natural objects like the foramina of the jaws or healed foci of osteomyelitis. The condition of the lamina dura in the plate is of vital importance. If the film is properly obtained this should always be visible and if it persists as a continuous white line it is evidence against the choice of extraction. The latter however is not practiced from the unfavorable x-ray find alone, for there must be superadded the evidences of systemic infection as obtained from blood counts and other laboratory resources, and the general tone of the patient. Lassitude, rapid fatigue, a lowered blood pressure (save of course in arteriosclerosis, etc.) low red cell count, reduced hemoglobin, in all chronic cases a low leucocyte count (leucocytosis may be found in the acute case), albuminuria (usually slight), are some of the general symptoms which indicate systemic infection. The x-ray has another use before extraction in connection with proper orientation of the teeth and jaws, lest there be present impacted or unerupted teeth and other anomalies.

Tuberculous Abscess of the Lower Jaw. Pietkiewicz (Paris). La Revue de Stomatologie, January, 1923, xxv, i.

The patient was a young woman aged twenty-two years, previously attacked by hip disease, a sister having died of tuberculous meningitis as a sequence of an osteitis of the foot. Despite her suspicious appearance the lungs seemed to be intact. The lesion of the mandible had been of very slow evolution—about 18 months. During the past 3 months the vague symptoms had become better defined, the subject complaining of painful mastication and a bad taste in the mouth. A fortnight before consultation the mandible had fractured but without any displacement of the fragments. The only violence was ordinary mastication. There was slight swelling of the mandible proper with some infiltration at the angle and ascending ramus, on the right side only. The x-ray showed the fracture had been associated with an abscess in the region of the unerupted wisdom tooth. To allow the pus to escape it was necessary to go through the bone with gouge and mallet. The grumous pus contained Koch's bacillus, and in curetting the cavity the wisdom tooth readily came away. The outlook for this patient seemed gloomy, both in regard to local sequelae and death from tuberculosis in some form. Necrotic bone may in such cases be several years in coming away completely.

However 18 months after intervention the radiographs appear to show complete recovery and clinically the fistula left by the operation is apparently permanently healed. The girl was sent away from Paris, as a result of which along with a recalcifying treatment she has gained 22 pounds. The lesion is said by pathologists to be very rare, while complete recovery from such a lesion is perhaps still more infrequent.

Pyorrheic Abscess on Living Teeth. M. Roy (Paris). The Dental Record, March 1, 1923, xliii, 3.

In this type of tooth we find response to heat and cold tests and other evidences of vitality along with a permanent gingival fistula. One naturally suspects a dead tooth but the probe instead of passing toward the apex of the root is arrested at a point nearer the crown. The technical name of such a condition is "pericemental abscess on a vital tooth" and the subject has been the occasion of much controversy. It has even been claimed that the cause is a gouty deposit or tophus on the root of the tooth.

As is known to readers the author's view is that these cases represent an aberrant form of pyorrhea alveolaris in which obliteration of the gingival orifice of the culdesac has caused an atypical evolution. Ordinarily gingival resorption is slower than osseous, which produces pocket formation along the root, this recess becoming occluded with debris of various kinds. Suppuration follows and pus escapes at the gingival orifice. Under certain conditions, as a protruding tooth which compresses and flattens the gum, the pus cannot escape by this route but forces an outlet elsewhere. Instead of the pressure of a tooth a piece of prosthesis may block the entrance with the same result.

In practice these cases are common and the mere presence of overocclusion should put us on our guard against the possibility of one of these abscesses, whether in the past or future. Two cases are given, due respectively to overocclusion and a vulcanite plate. A third case occurring in a dentist with excellent teeth was much more obscure in its origin and nature; the author finally attributed the lesion to the constant use of floss silk which acted as an occluding agency on the gum.

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EDITORIALS

The Dental Hygienists Bill in Illinois

THE dental profession is greatly divided upon the value of Dental Hygienists and we find a few men are exerting every effort to have laws passed establishing dental hygienists in various states. The dental profession of Illinois is at present divided over the value of House Bill No. 445, which has to do with the licensing of dental hygienists. The bulletin of the Chicago Dental Society of April 24 contains a criticism to House Bill No. 445 and an answer to the criticism. We often find that the men in the profession who favor a law for dental hygienists possess a personal motive. The arguments in favor of the dental hygienists as presented by the committee is of the same indefinite and elementary type that are always put forth in favor of such

bills. Those who favor the bill speak in generalities and fail to present any definite and concrete facts or arguments. Furthermore, it is interesting to note that the Chairman of the Committee who favors the approval and support of the Dental Hygienists Bill is interested in a school having for its purpose the education of dental hygienists. This supports our contention, that the majority of men who speak in favor of dental hygienists, do not have in mind the advancement and the best of interest of the dental profession and public, but are more concerned in their own interests and selfish purposes. This explains why the Chairman of the Committee, as published in the Bulletin, favoring the Dental Hygienists Bill is so active, in answering the criticism of certain members in the Chicago dental profession who are opposed to House Bill No. 445.

The criticisms against the Dental Hygienist Bill of Illinois as raised by members of the Chicago Dental Society are so accurate and logical we are publishing them, hoping that some of the friends in favor of dental hygienists will not forget to answer these criticisms and arguments next time they speak in favor of the benefits which dental hygienists are to the public.

The criticisms are as follows:

"It is our contention that the granting of a license to practice hygiene as outlined in Section 3 is an infringement on the rights of the dentist."

"The removal of calcareous deposits and stains from the exposed surfaces of teeth only, would be malpractice, in that the real surfaces on which these secretions and deposits generally form are not exposed, but hidden and covered by the mucous or soft tissue of the mouth."

This is an argument which has often been made in the past and none of the men who favor dental hygienists have answered it, because it cannot be answered honestly. Everyone knows that the benefit to be derived from a prophylactic treatment is not the polishing of the crown of the tooth but the removal of the deposits under the soft tissue, which is a field that the dental hygienists should not invade and if she has not removed those deposits under the gum her value is nil. The Committee also states, "Furthermore, we contend that prophylaxis includes the proper separating of teeth, and re-establishing of contacts, the filing and polishing of fillings, the grinding and polishing of the occlusal surfaces of the teeth for the prevention and correction of traumatic occlusion."

Under the head of prophylactic work, might also be added the insertion of cement fillings in the fissures of first molars, which is a work that is very important; comes under the head of prophylaxis, and is one that the hygienist is not allowed to do; if she does do it it will be a violation of her license.

"Furthermore, that the removal of calcareous deposits, stains and secretions implies the use of drugs and medications to stimulate the soft tissue and restore the abraded surfaces of the gums, and as such should not be applied by any person but a dentist."

We have long contended that one who possesses less knowledge than that of a D.D.S. should not be allowed to do any part of a dental operation. The committee also raised another argument which cannot be answered by those who favor dental hygienists, which is as follows:

"Furthermore, that the work outlined will take away from the dentist the opportunity to discover the necessity for corrective work. Furthermore, that the working at or upon any part of the hard or soft tissues of the body has in the past been defined as surgery, from which we derive our title D.D.S. and that the granting of this privilege to anyone without an equal amount of preparation shall be considered as class legislation and contrary to the fundamental articles of our constitution."

Another point which we would like to have the distinguished gentlemen of the committee who are favoring the passing of the Dental Hygienists Bill in Illinois answer, is in regard to dental education. The Chairman of the Committee has often talked long and loud in regard to raising dental educational requirements. We fail to see the logic and common sense of the advancing dental educational requirements that allow a dental hygienist with an eight months' training and an inferior preliminary training to go out and compete with a dental graduate. The men of the Chicago Dental Society who oppose the Dental Hygienists Bill raised this argument and the committee that attempted to answer the criticism, very carefully avoided answering it: "What in the name of common sense is the use of raising the requirements of the dental student, and then when he finally graduates after five years of hard work, put him into competition with an eight months' graduate?" It seems to us from an educational standpoint that it is useless to raise the requirements of dental education for the dental student and then allow dental hygienists, dental mechanics, and dental assistants to crawl under the bars. We believe such a course is extremely unfair to the dental student and an imposition on the public and so illogical that we fail to see how men can favor such a plan of dental education. We only hope that Illinois will not make the mistake made by other states in licensing dental hygienists because the committee in favor of dental hygienists can very easily obtain a large number of affidavits of men practicing in states that have dental hygienists laws, that would prove such laws have not been satisfactory. To date the dental hygienists have failed to render the wonderful service to the public that has been pictured by those men who have personal motives in favoring dental hygienists. We only hope that the advocates of the Bill will be fair, present arguments that are logical in regard to dental education and the benefits to be derived by the profession. We believe the dental profession of Illinois as a whole is too far advanced scientifically to allow a few with special interests to pass a Dental Hygienists Bill which would be a detriment to the profession as a whole.

Local Anesthesia in Dentistry*

AFTER nine years Prof. Dr. Guido Fischer has given us a thoroughly revised edition of his well-known work on Local Anesthesia in Dentistry. The earlier editions of this book established its reputation so securely that it is unnecessary to go into a detailed review of the present publication. In

*Local Anesthesia in Dentistry, By Prof. Dr. Guido Fischer, 3rd. American Ed. Trans. and Revised by Dr. Richard Reithmuller, D.D.S., 139 Illustrations, Lea and Febiger, Philadelphia, and N. Y.

the preface the translator, Dr. Reithmuller, in speaking of the science of Conduction Anesthesia says: "Without its aid the wonderful facio-maxillary restorations which dental and oral surgeons of all nations performed during the World War, would have been well-nigh impossible."

Much new material has been included so as to bring this edition up to the present knowledge of the subject. Among the changes which will be noted is the term, Conduction Anesthesia, which replaces the older form Conductive Anesthesia which was used in the earlier editions. This is in line with the nomenclature adopted by the A.D.A. and the Dental Teachers Association. There are many Exodontists in this country who will take exception to the claims of the superiority of local over Gas and Oxygen anesthesia. The technic of the latter has been raised to a high degree by Winter and his followers and very efficient apparatus for the administration of this anesthetic compound has been developed.

The author might have devoted more space to the discussion of the breakage of the needle. With the wide use of Conduction Anesthesia, particularly the mandibular injection, the number of broken needles naturally tends to increase, due no doubt, to ignorance or carelessness. The importance of this question from a medico-legal standpoint should not have been overlooked. The use of large caliber needles as recommended by Blum, would prevent many such accidents. The author recommends that the procedure advocated by Williger be employed in removing a piece of broken needle.

The subject of novocain dermatitis in dentists is covered fully in this edition, being a new manifestation recognized since the publication of the earlier editions. The author lays great stress on the careful preparation of all solutions, and the observance of a strict asepsis. In speaking of injury to blood vessels he says: "An injury to a blood vessel becomes dangerous only if the sterility of the solution or instrumentarium has been neglected."

It is with great pleasure that we note the omission of all reference to "devitalizing fiber" from that part of the work dealing with pressure anesthesia.

A chapter on the blood supply of the masticatory apparatus has been included, made necessary by the addition of several pages devoted to extraoral anesthesia. The author, however, evidently does not strongly recommend this procedure as he says, "In dental practice extraoral blocking is called for only in rare instances, hence it is difficult to acquire the necessary experience." The new technic of Sicher, for the infraorbital injection is described at length and the accompanying illustrations make this proceeding clear.

The teachings and writings of Guido Fischer, adapting the methods of Braun to the field of Dental and Oral Surgery, have been adopted almost universally by the dental profession. He has established those procedures which with minor variations are universally followed.

Every surgeon who employs local anesthesia should unquestionably possess this work. It is unnecessary to say the same of every dentist, since that profession has long ago accepted "Fischer's Anesthesia" as an authority on this subject.

The publishers have produced a very pleasing volume, both as to typography and illustrations. —J. T. H.

ORTHODONTIC NEWS AND NOTES

Chicago Dental Society

The annual clinic and meeting of the Chicago Dental Society will be held at the Hotel Drake, January 17th, 18th and 19th, 1924. Please address the undersigned for further information.—M. M. Printz, Secretary, 25 E. Washington St., Chicago.

The Annual Post Graduate Course in the Royal College

Immediately following the meeting of the National Dental Association in Cleveland, the Board of Directors of the Royal College of Dental Surgeons will conduct an intensive Post Graduate Class at the College Building in Toronto, from Monday, September 17th to Saturday, September 22nd, 1923.

The following subjects have been decided upon, from which each member may chose:

> Preventive Dentistry, Diagnosis, Pathology, Periclasia, Operative Dentistry, Surgery, Partial Dentures, Crown and Bridge, and Full Denture Work.

The personnel of instructors is as follows:

Drs. I. H. Ante,
J. A. Bothwell,
Harold K. Box,
F. A. Clarkson,
W. E. Cummer,
E. F. Risdon,
Edgar Paul,
A. E. Webster,
Wallace Secombe.

A cordial invitation is extended to all ethical practitioners. Those who attend the National Dental Association meeting in Cleveland will find Toronto but nine hours railroad journey from Cleveland. Further particulars may be had by addressing the Royal College of Dental Surgeons, 240 College St., Toronto, Ontario.

Notes of Interest

An expedition of twenty boys are on their way through the cliff dwellers ruins of the Mesa Verde National Park in Colorado and New Mexico. They are making the trip through the Park by saddle horses and pack train and are being led by Dr. H. C. Pollock and Dr. Leo Shanley, orthodontists of Saint Louis, Missouri.